FOOD MANUFACTURE

...RD HILL LIMITED, STRATFORD HOUSE, 9 EDEN STREET, LONDON, N.W.1. DECEMBER 1, 1952

664

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CLARK'S CARAMEL

IN THE BAKERY

The right Caramel, Clark's Bakery Caramel, not only gives colour but has an improving effect in wheatmeal and malt breads and in rich cakes. A softer eating crumb is produced, together with a moistness which improves the keeping qualities. Confectionery Bakers are also using Clark's Mocha D the "Caramel with a flavour" for buttercreams, cream fillings, fudge icings and fondant. As well as a pleasing and delicate caramel colour, it gives a definite coffee-like flavour.

In addition to the normal liquid Caramel as used in the Bakery, both these grades can be supplied in powder form for use in wheatmeal flour, cake mixtures and all types of dry-mixed goods.

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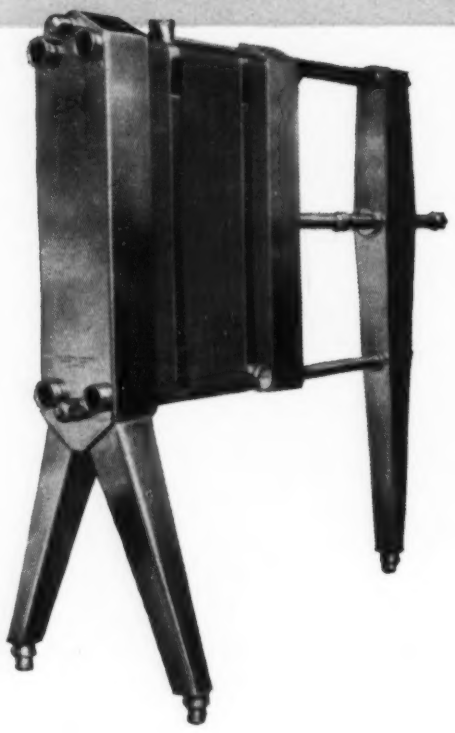
APV *announce*

a new all-stainless, medium capacity

PARAFLOW



Here is news of another milestone in the progress of the Paraflow. APV announce a new model — the Type H.X. — that brings the advantages of all-stainless steel construction within reach of the low and medium capacity duties. The Type H.X. Paraflow has a new type of plate that enables the machine to withstand higher pressures than has been possible with plate heat exchangers of its capacity range and yet it still maintains the high efficiency of heat transfer for which the Paraflow is well known. This appreciably extends its field of application.

This new Paraflow embodies in its constructional features all the lessons learnt in producing over 7,000 machines since APV introduced the plate heat exchanger thirty years ago.

- Stainless steel internal and external surfaces throughout.
- Operates at pressures up to 100 lbs. per sq. in.
- Wide range of capacities — 100 to 900 g.p.h. on milk pasteurisation.
- Wide range of applications such as: Pasteurisation, cooling and pre-heating of milk, cream, skim milk, ice cream mix and evaporated milk. Butter wash water chilling. Starter milk heat treatment. Artificial cream processing, Reconstituted milk processing. Waste heat utilisation. Heating, cooling, sterilisation and pasteurisation of wine. cider, vinegar, beet-juice, fruit-juice, etc. Cooling yeast, sugar, salad cream, etc.

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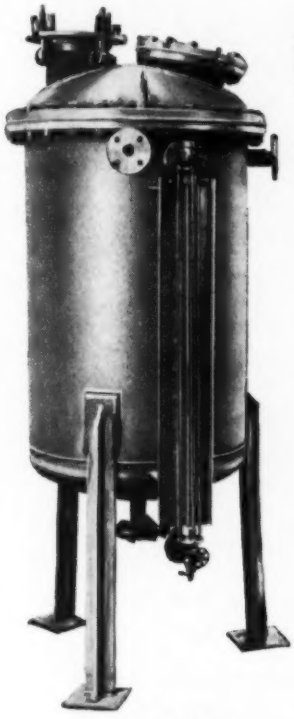
Above: 50-gallon stainless steel tipping pan.

Below: 720-gallon stainless steel storage tank.



55-gallon stainless steel processing vessel.

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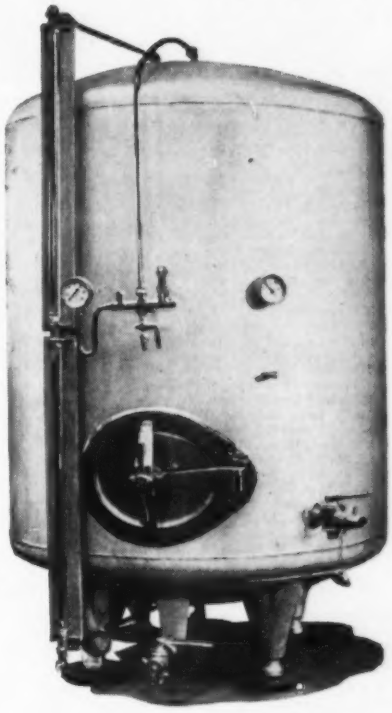

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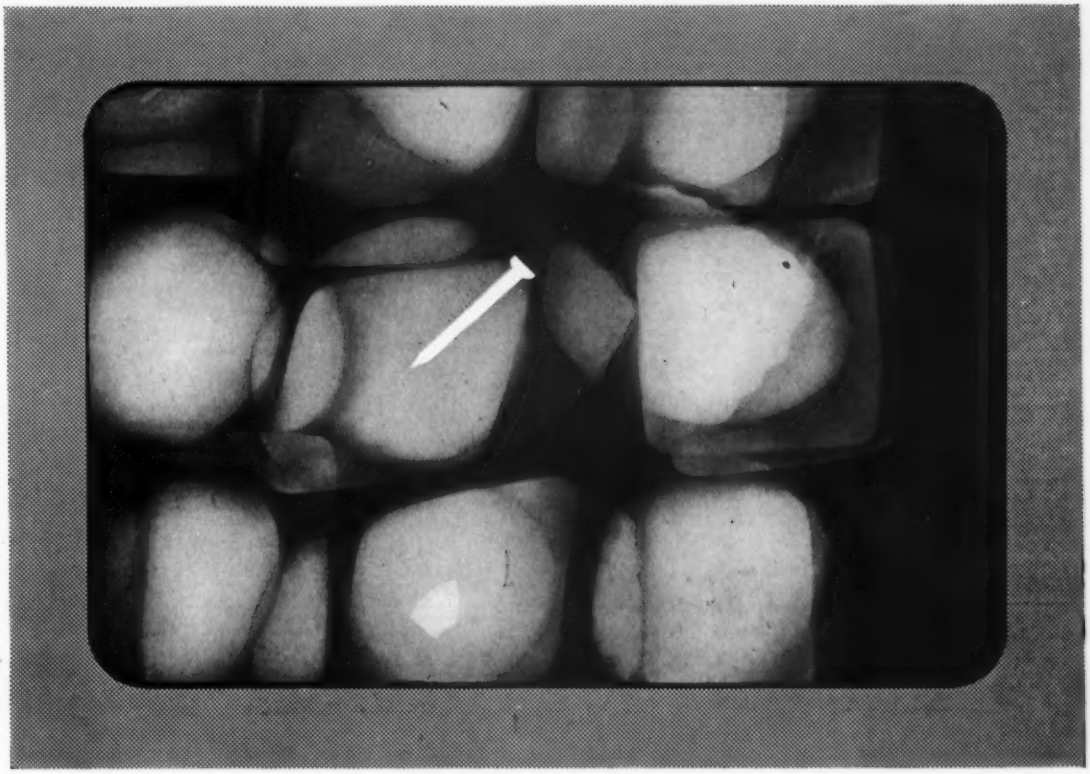

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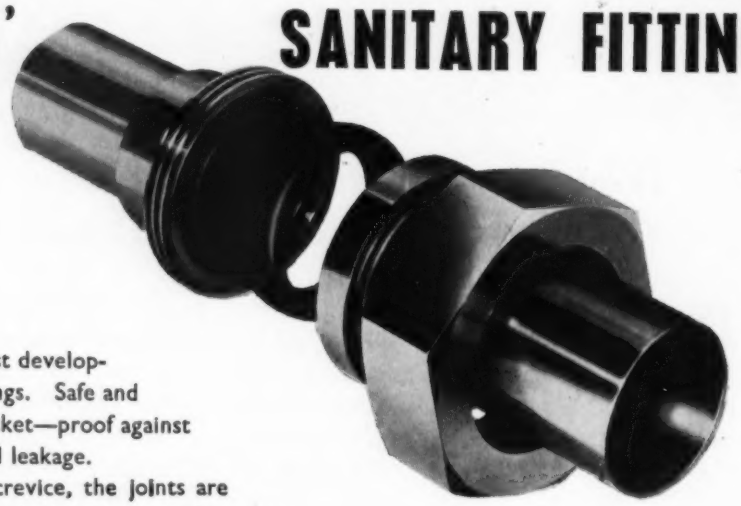

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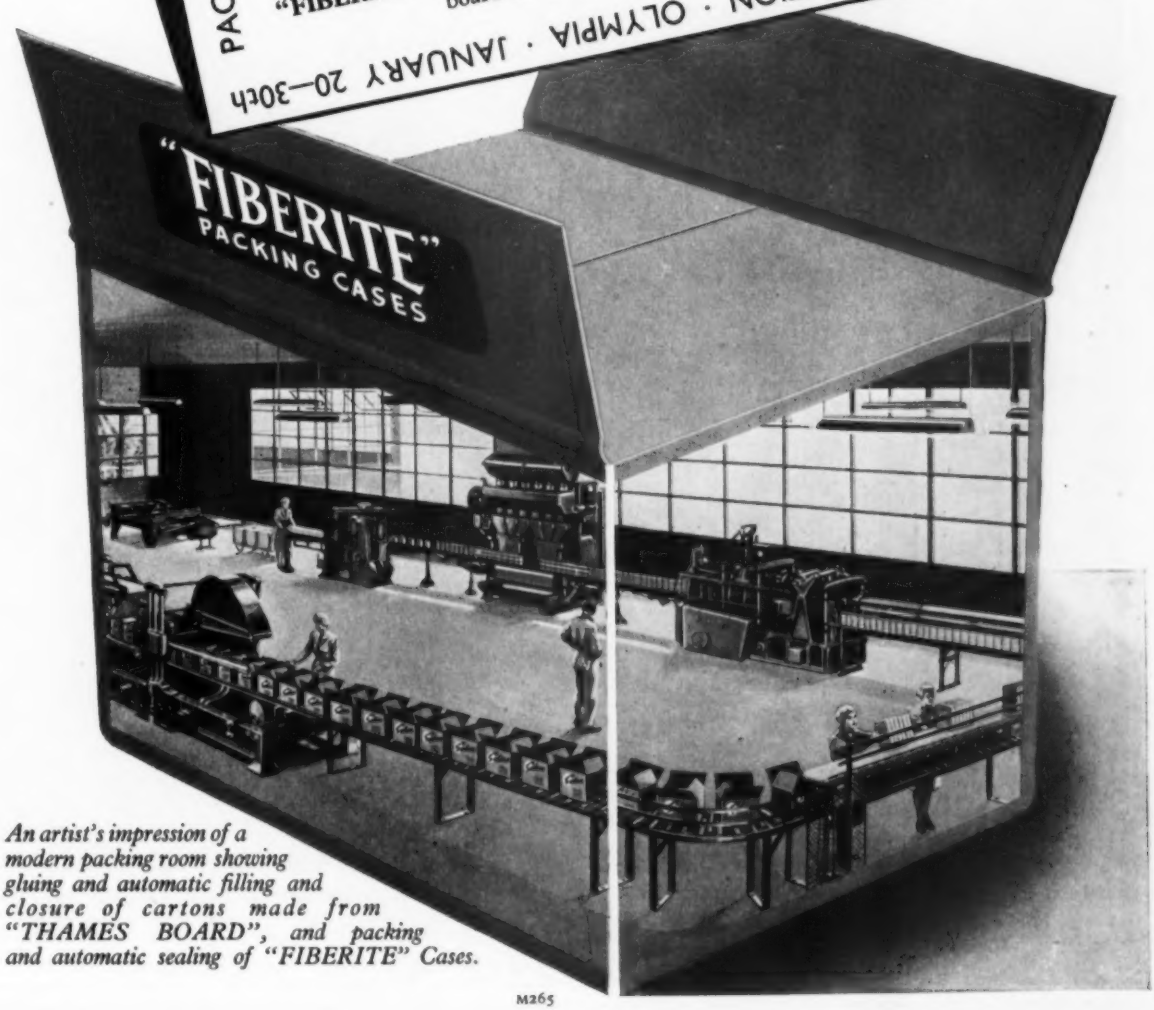

An artist's impression of a modern packing room showing gluing and automatic filling and closure of cartons made from "THAMES BOARD", and packing and automatic sealing of "FIBERITE" Cases.

M265

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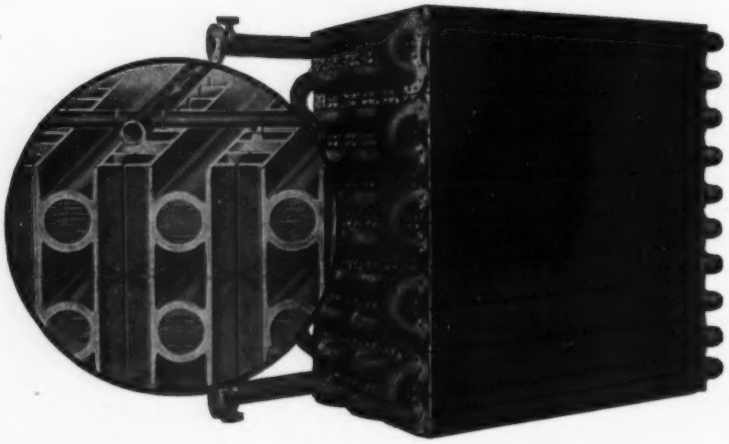
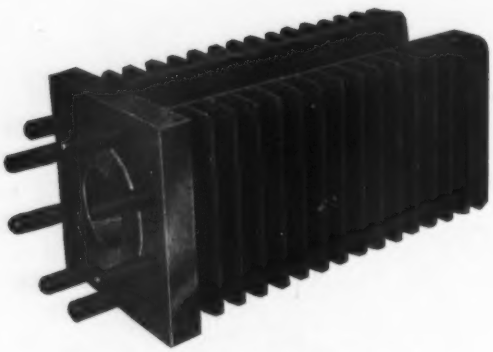
by recovering waste heat in a

SENIOR ECONOMISER



Senior-H (Cast Iron) Economiser: For all industrial pressures.



Construction of H-Tube Economiser Element, showing Straight Gas Passages.

It recovers the heat from the waste hot flue gases and puts it into the boiler feed water, saving from 10 to 20 per cent. of the fuel used. It quickly repays the cost of installation, often in less than a year.

The gas passages formed by the straight H-type gills on the heating elements ensure exceptionally clean heating surfaces and high heat recovery is maintained, usually without the use of soot blowers. Attention and maintenance costs are correspondingly low and availability high.

Senior Twintube Economiser: For higher pressures as used in Central Power Stations.

Senior Welded Economiser: For pressures up to the highest, when the feed-water is suitably conditioned.

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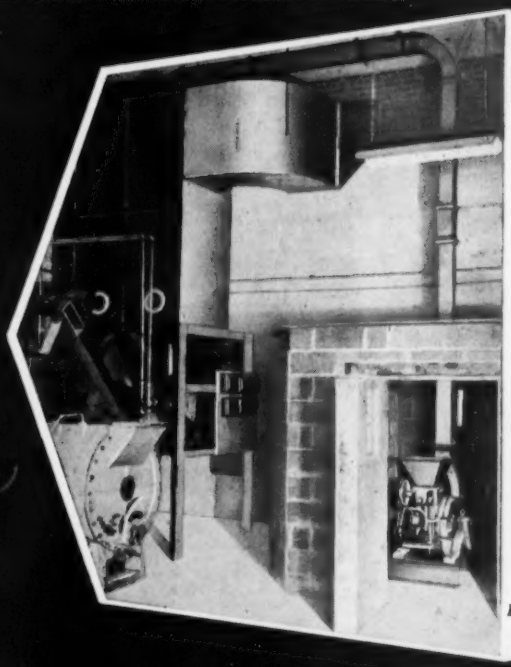
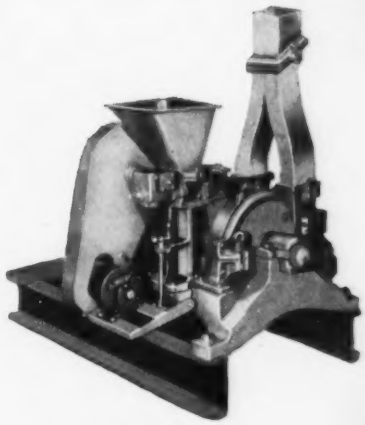


Left: Typical installation of No. 6 MIKRO-ATOMISER *and* MIKRO-COLLECTOR *in large chemical plant.*



Right: No. 6 MIKRO-ATOMISER

FOUR ADVANTAGES

OF THE MIKRO-ATOMISER

★ SMOOTHER ULTRA-FINE GRINDS
★ SAVINGS IN POWER
★ IMPROVED FINISHED PRODUCTS
★ LOWER INVESTMENT COSTS

The MIKRO-ATOMISER has proved a boon to many manufacturers, particularly in the fine grinding of:

CHEMICALS	DRUGS
DYESTUFFS	PHARMACEUTICALS
PIGMENTS	SUGAR MIXTURES
INSECTICIDES	FOOD MIXTURES
SUGAR	SYNTHETIC RESINS
COCOA	COSMETICS

Because of its phenomenal ability to produce smooth, ultra-fine grinds and blendings at remarkably low temperatures, more and more economy-minded manufacturers are turning to the MIKRO-ATOMISER as a means of improving their products and lowering production costs.

The MIKRO-ATOMISER has made possible grinding in the lower micron range without exorbitant production and equipment cost as compared with other available equipment. It is ideal for the ultra-fine grinding of certain insecticides for spraying operations.

SEND FOR — full details of our production and test grinding facilities.

MIKRO-PULVERISER (FINE)
MIKRO-ATOMISER (ULTRA FINE)
MIKRO-COLLECTOR (100 PER CENT)
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IN VERY MANY TRADES it does. Where consistent quality depends on constant temperature and humidity, air conditioning is the only way to ensure a low rejection rate. In others, where fumes or dust can mar the work, conditioned air is sometimes essential, and often desirable. Modern air conditioning plant provides predetermined air conditions in large or small spaces and is fully automatic. It is one more example of electricity used efficiently to maintain the level of production.

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★ **CINEMA - TELEVISION** prices are the lowest possible compatible with the quality of materials used plus the unrivalled technical skill and practical "know-how" employed.

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1950	First Detector with *equal* sensitivity to all metals.
1951	First Automatic Rejection Systems introduced.
1952	First Miniaturised Multi-Channel Detector.
1953	And now our latest equipment to be shown for the first time at the Packaging Exhibition, Olympia, Jan. 20th-30th.

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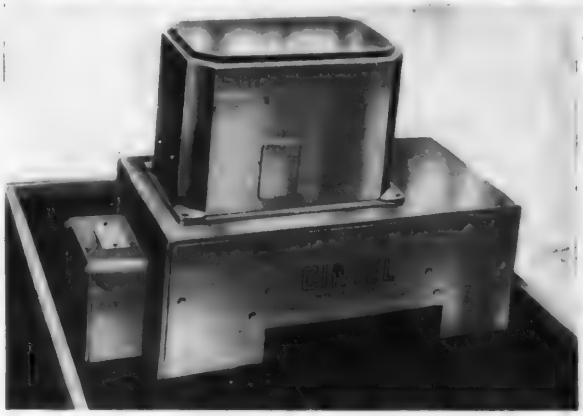

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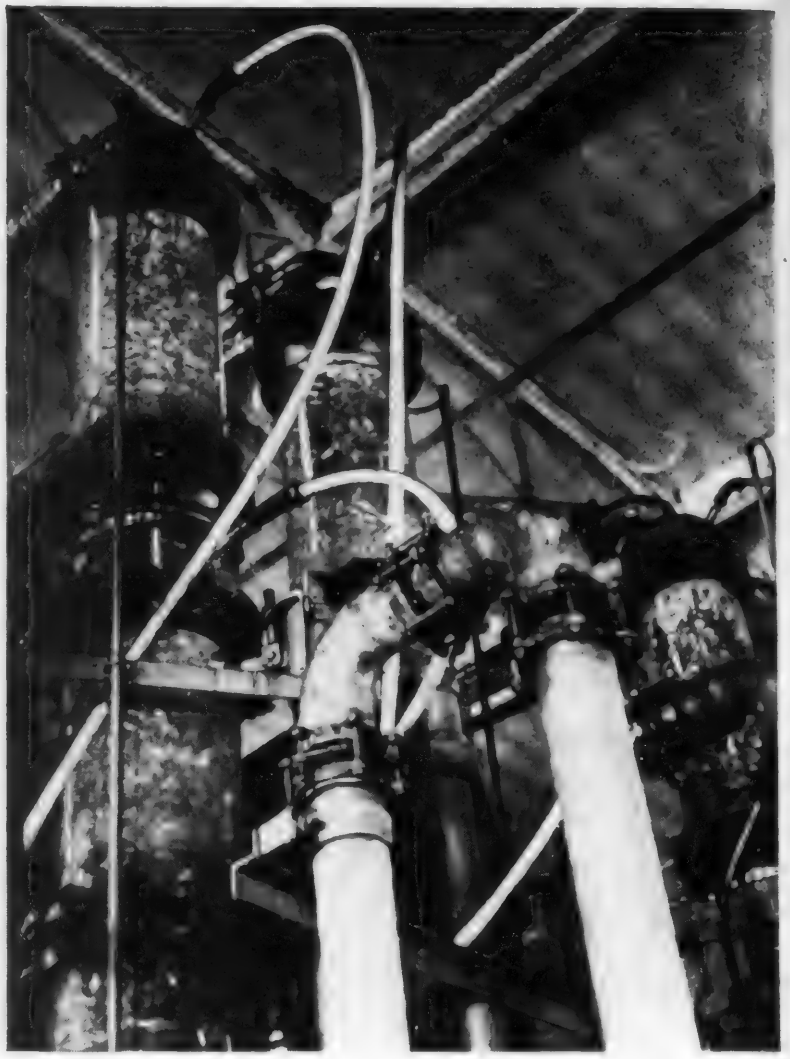

Section of Hydrochloric Acid Absorption Towers
(Photo by courtesy of I.C.I.)

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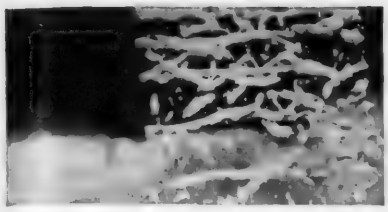

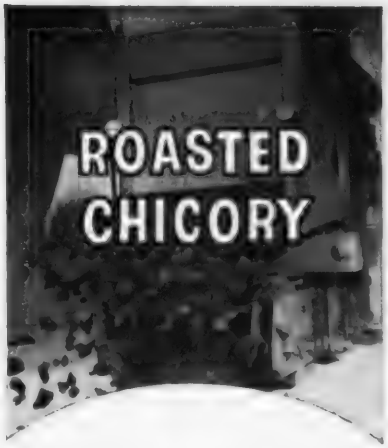

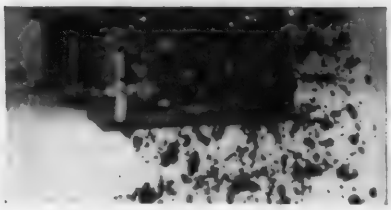

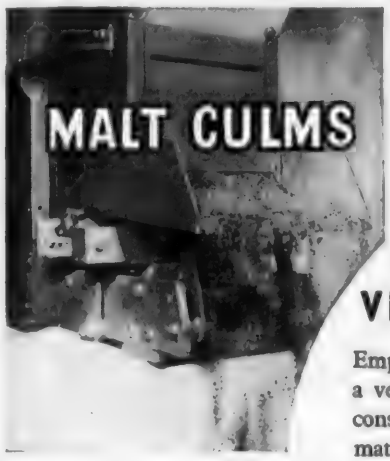

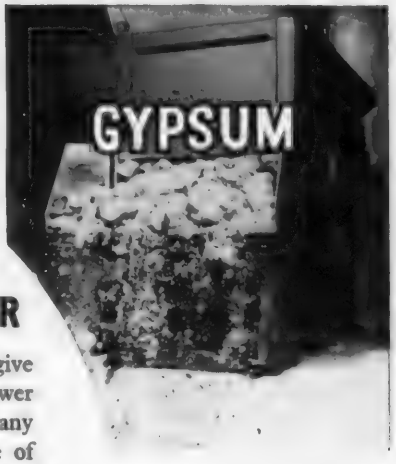

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Employing a new, patented vibratory system to give a very wide range of performance with low power consumption, the Velofeeder can handle many materials with characteristics outside the scope of conventional feeders. Precise feed rate settings can be obtained with automatic or manual controls, and an electronic servo controller* can be incorporated to give positive, accurate regulation of feed in response to any measurable variant.

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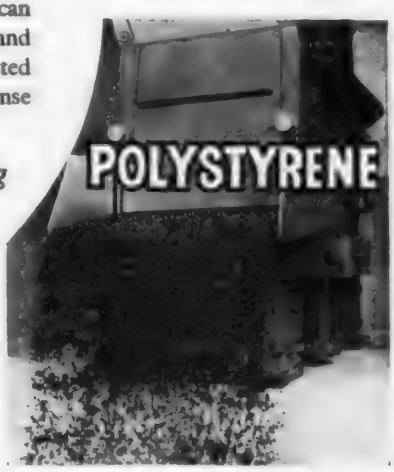

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LOW POWER CONSUMPTION
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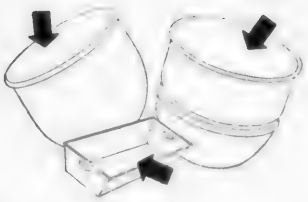
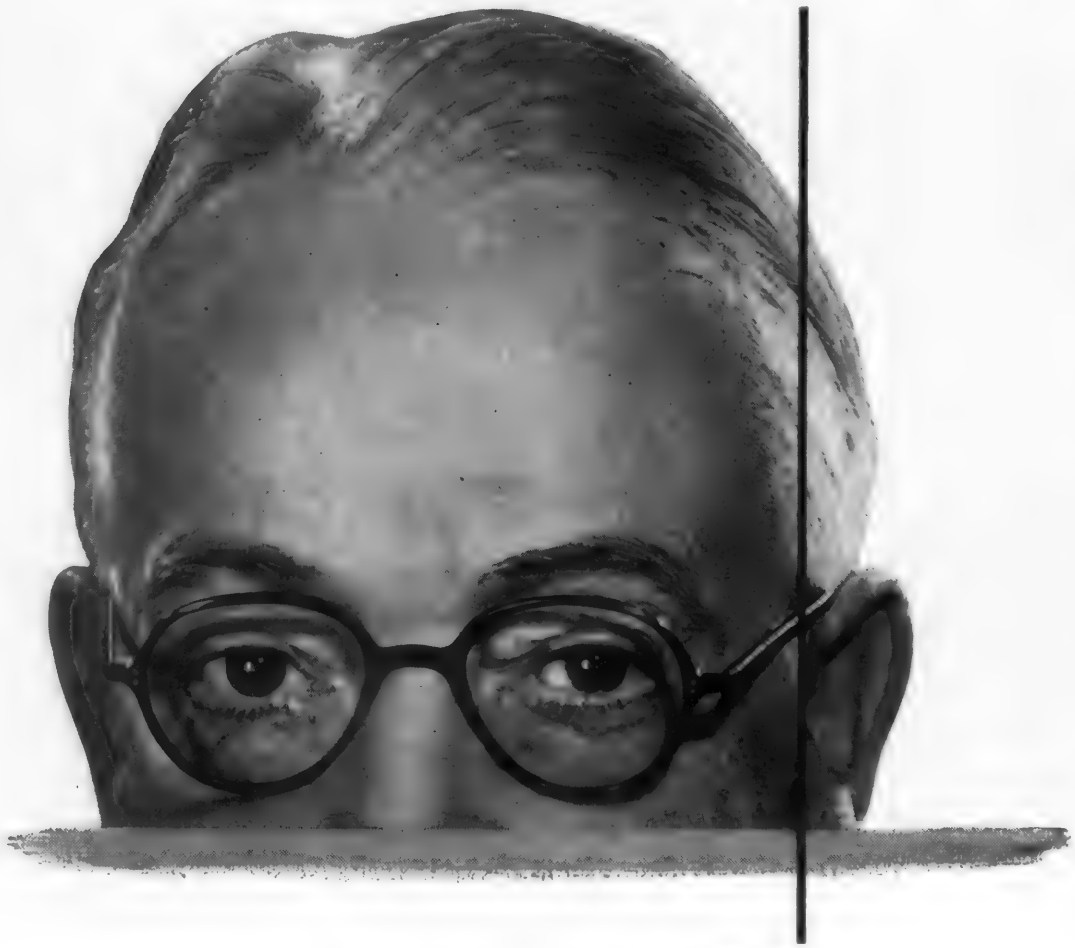
Our works motto is 'Keep it clean'...





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These days we tackle all our cleaning scientifically with Teepol. Of all the various cleaning aids I've sent into the factory at one time or another, **TEEPOL** *is outstanding for thoroughness, ease and low cost. The people who have to use it, like it too!*

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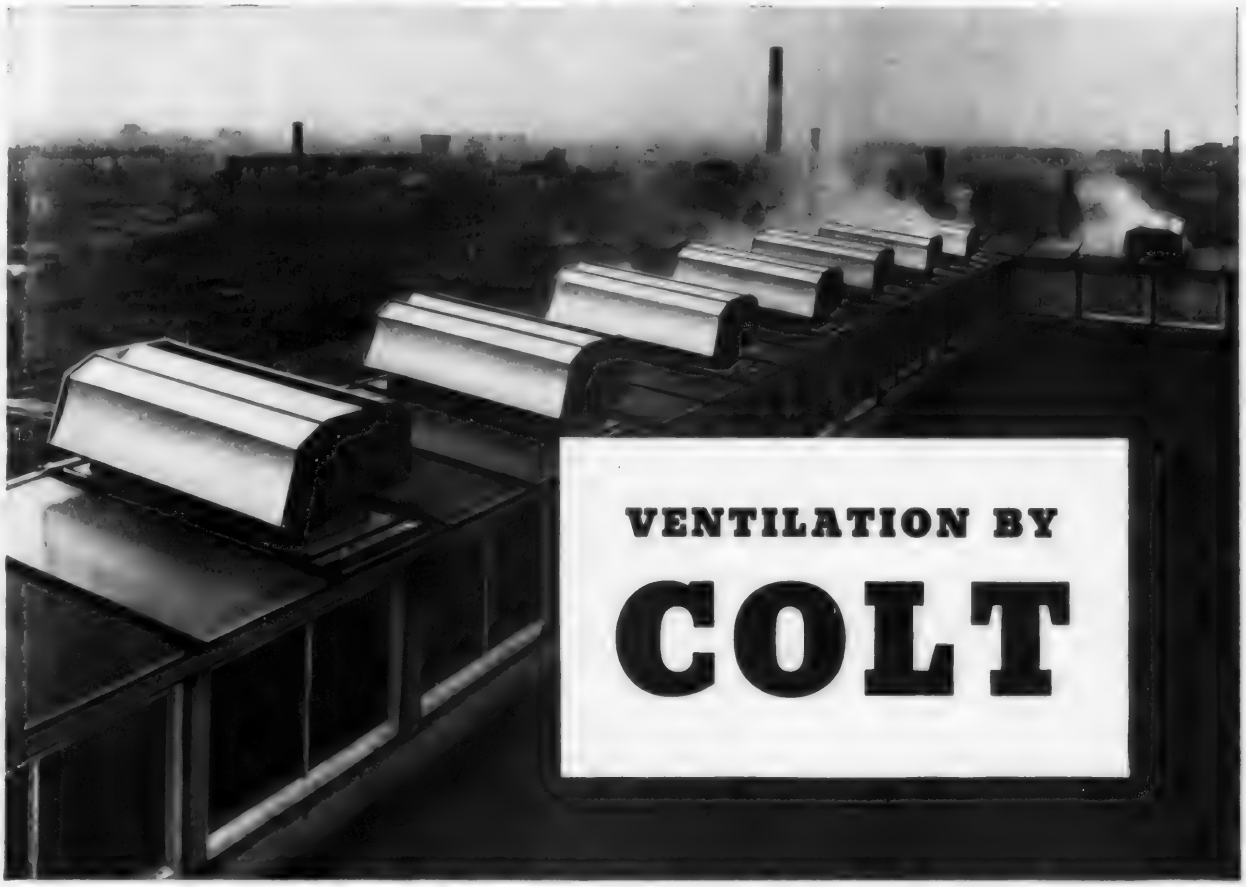
F.6.

At Pearce Duff & Company Limited . . . . . .



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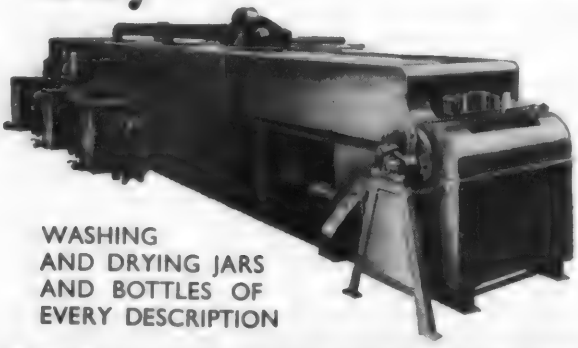

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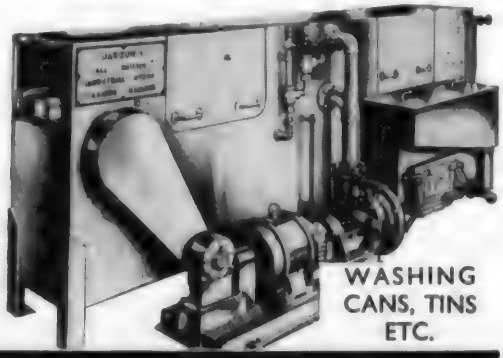

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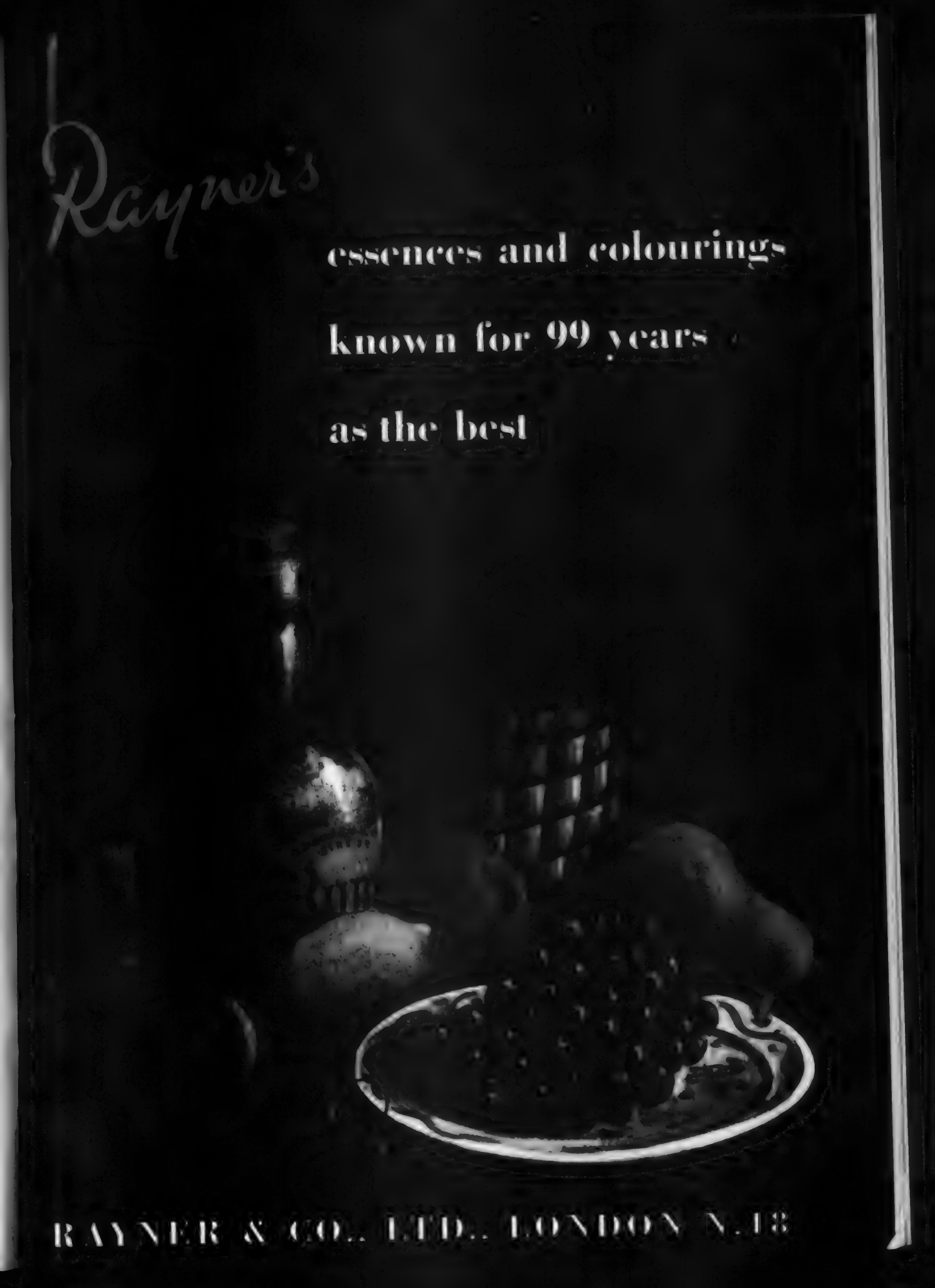

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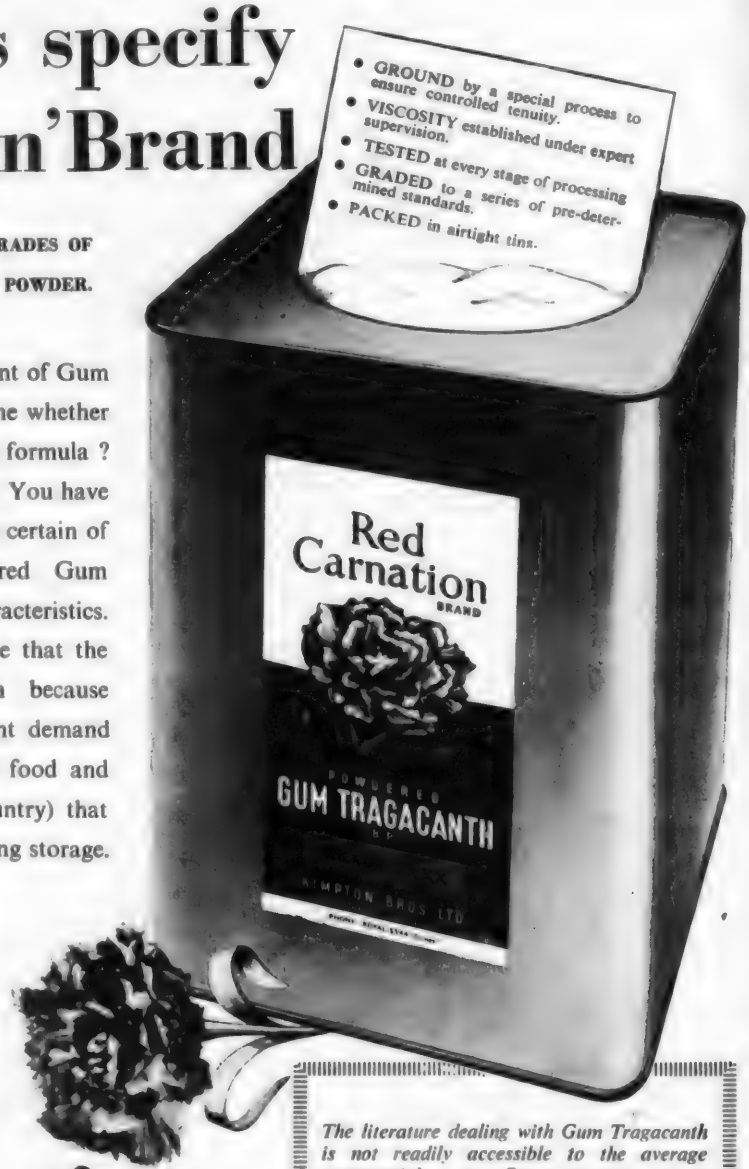
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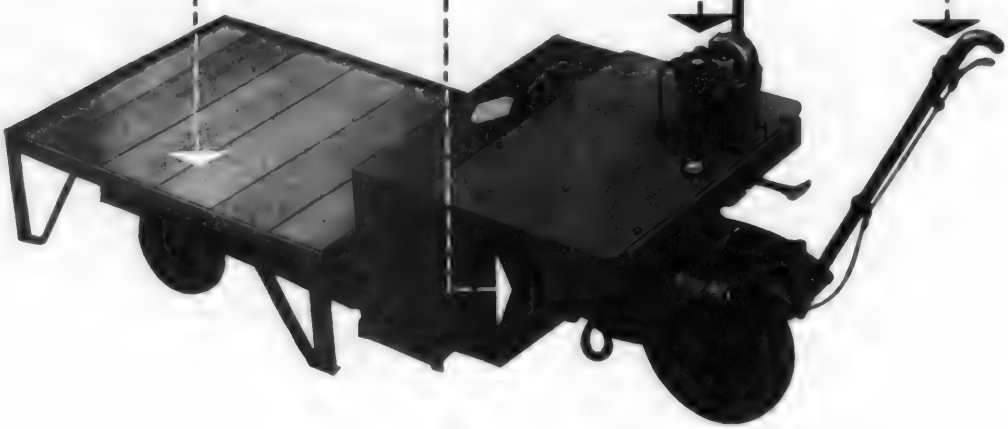

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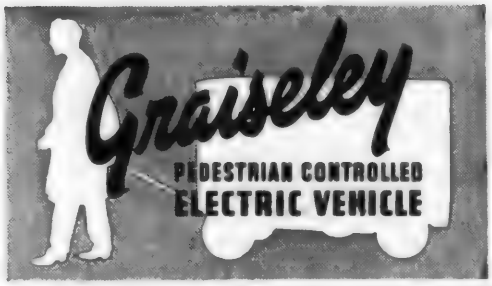

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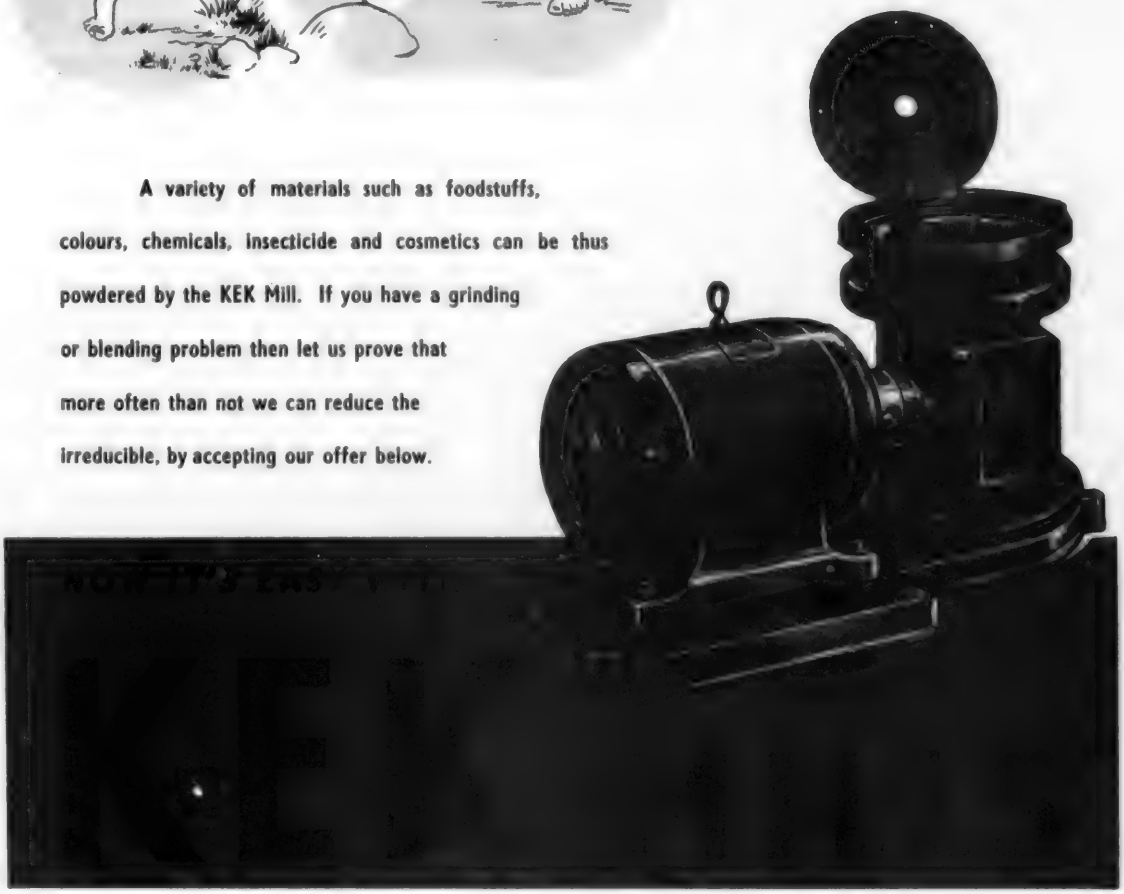

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A simple Single-pen Evershed Operation Recorder for maintaining on a chart the complete history of a single operation. Very useful as a check on the operation of automatic plant and hand controlled apparatus that is in and out of use at intervals.

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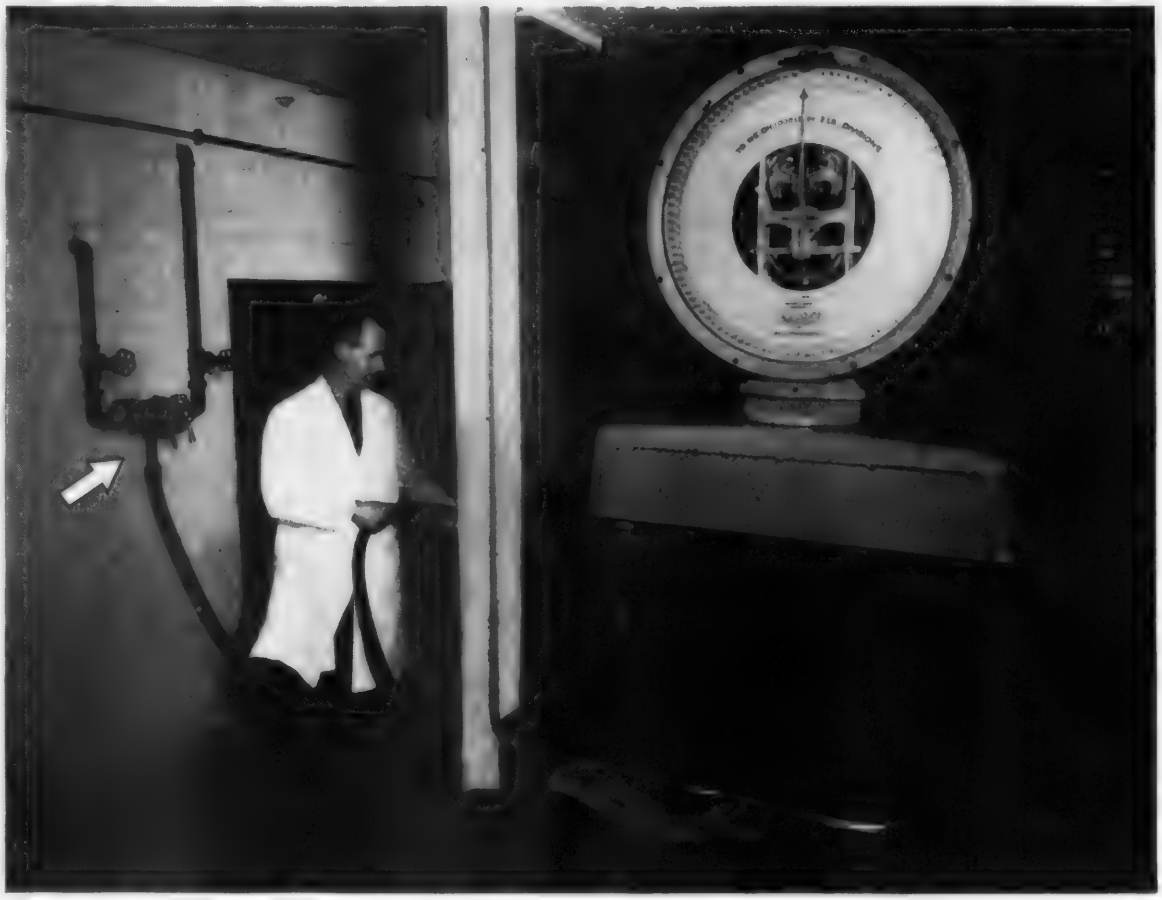

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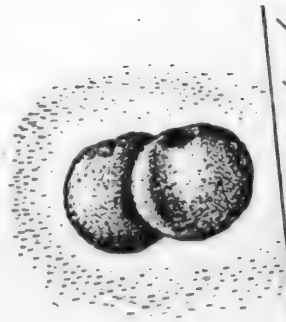

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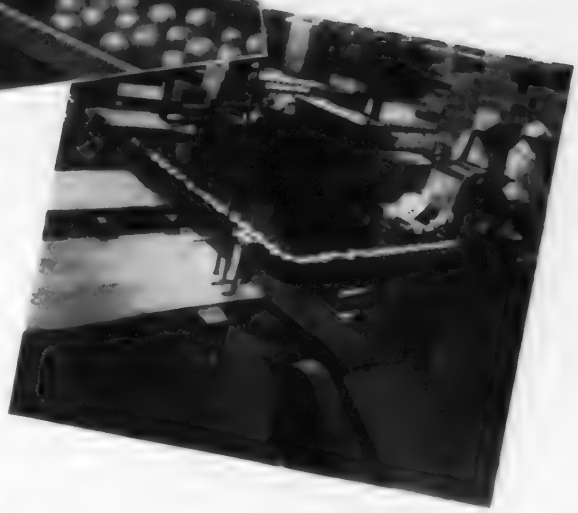

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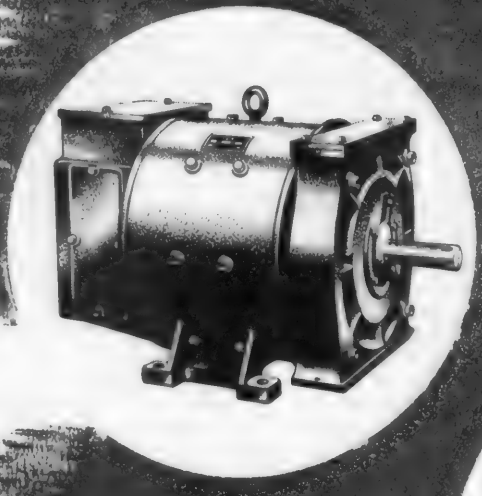

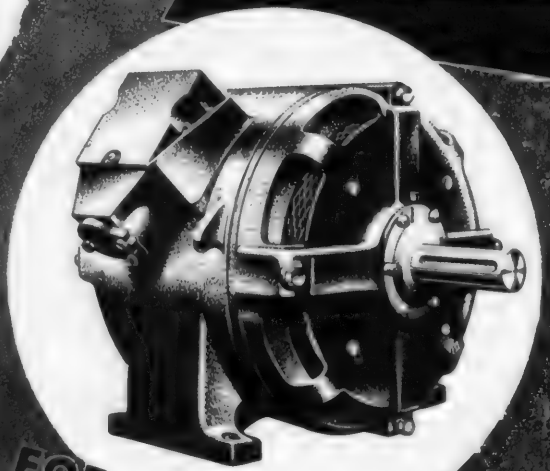

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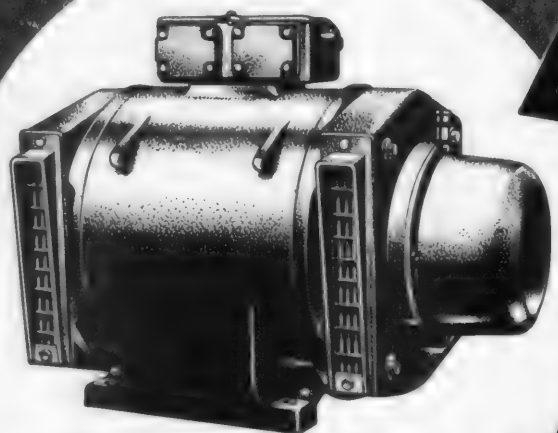

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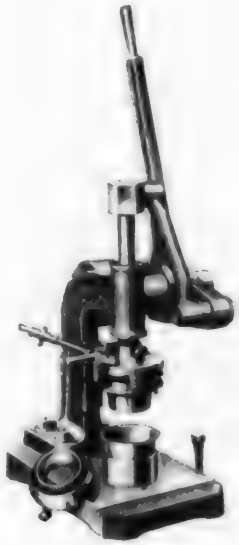

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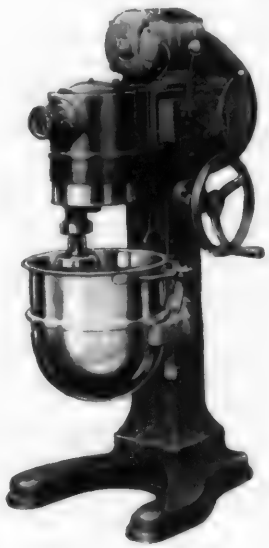

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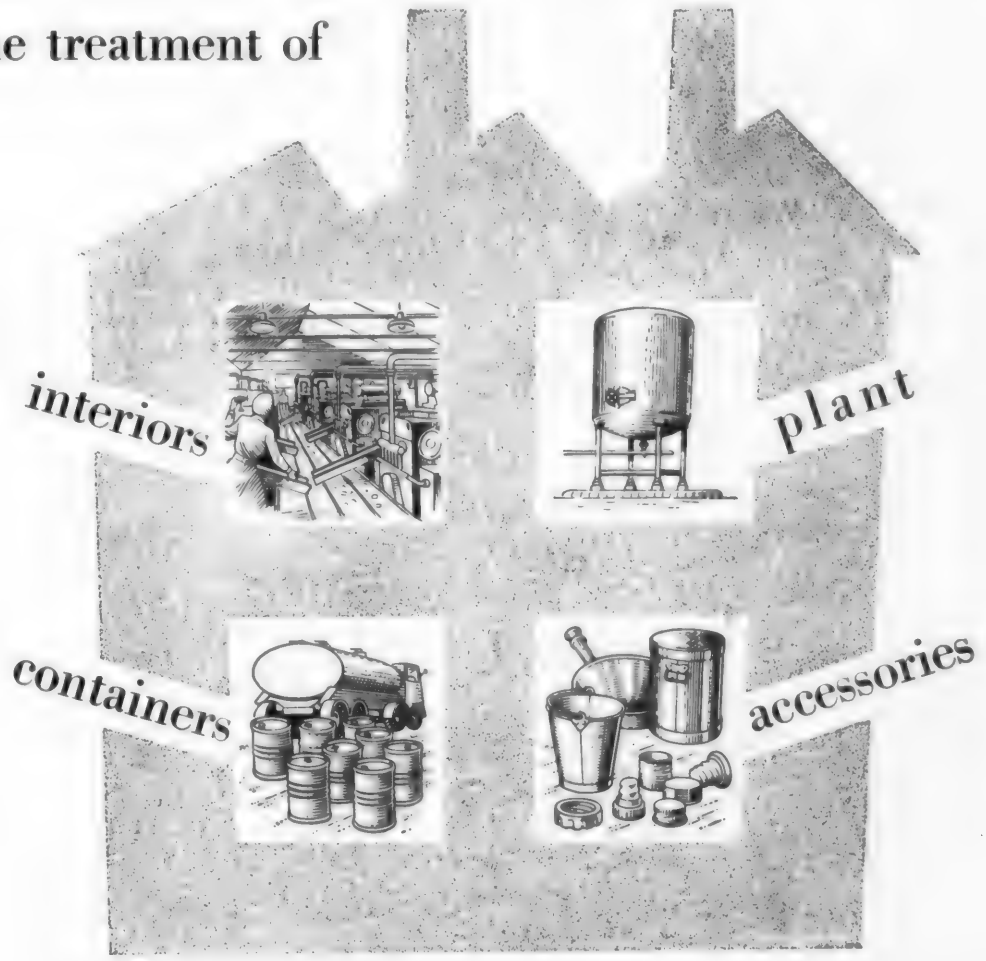

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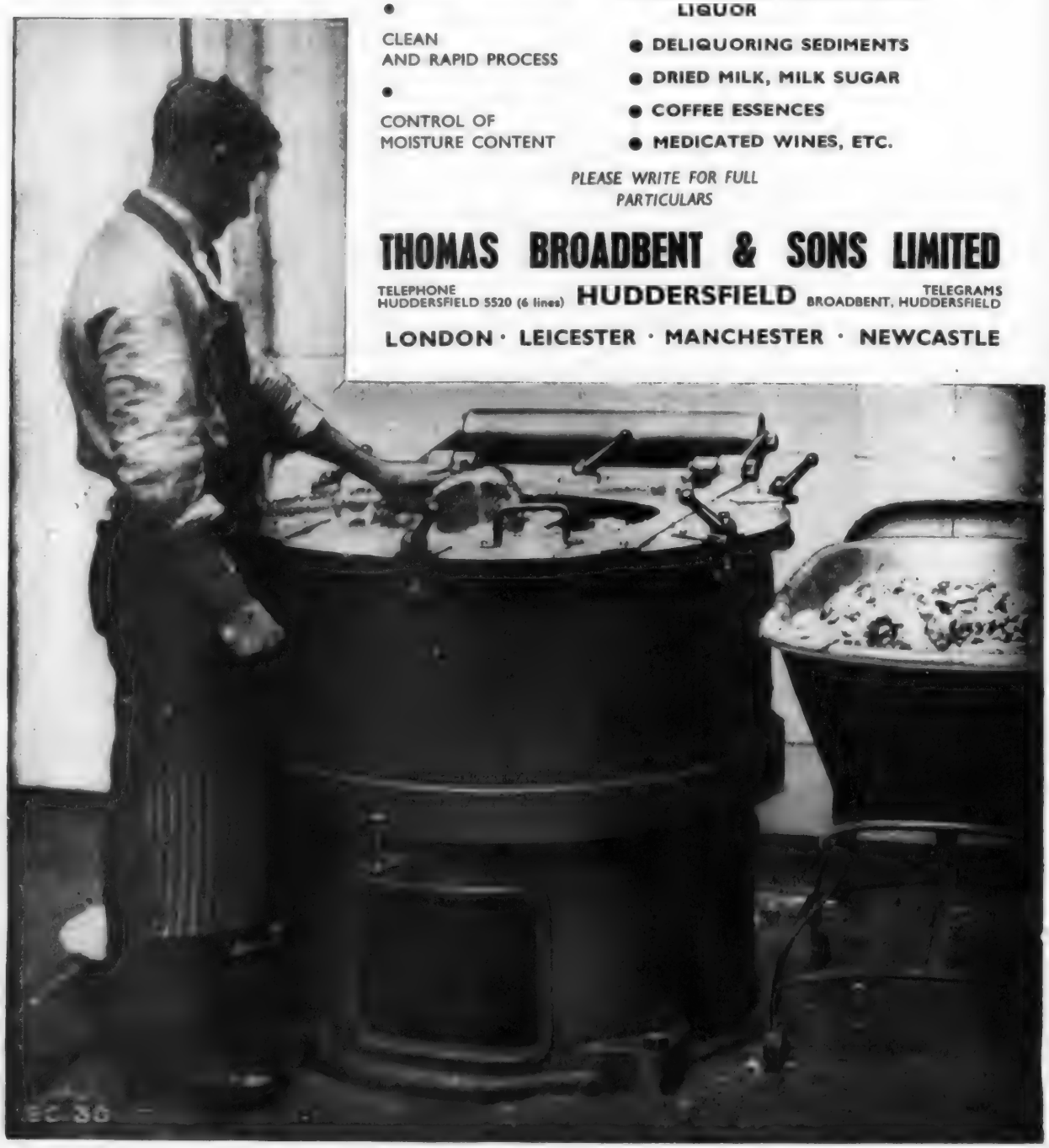

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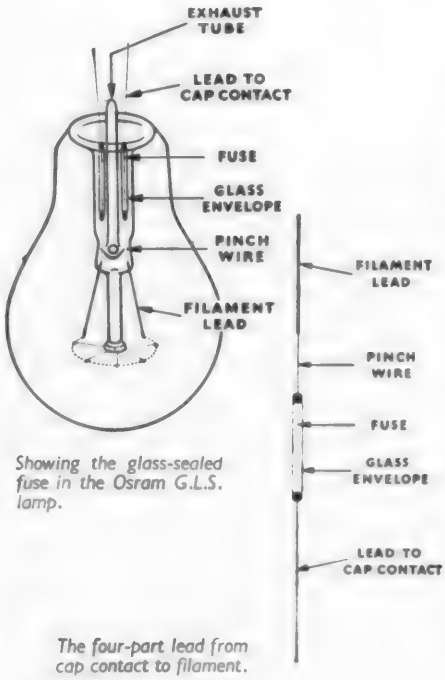

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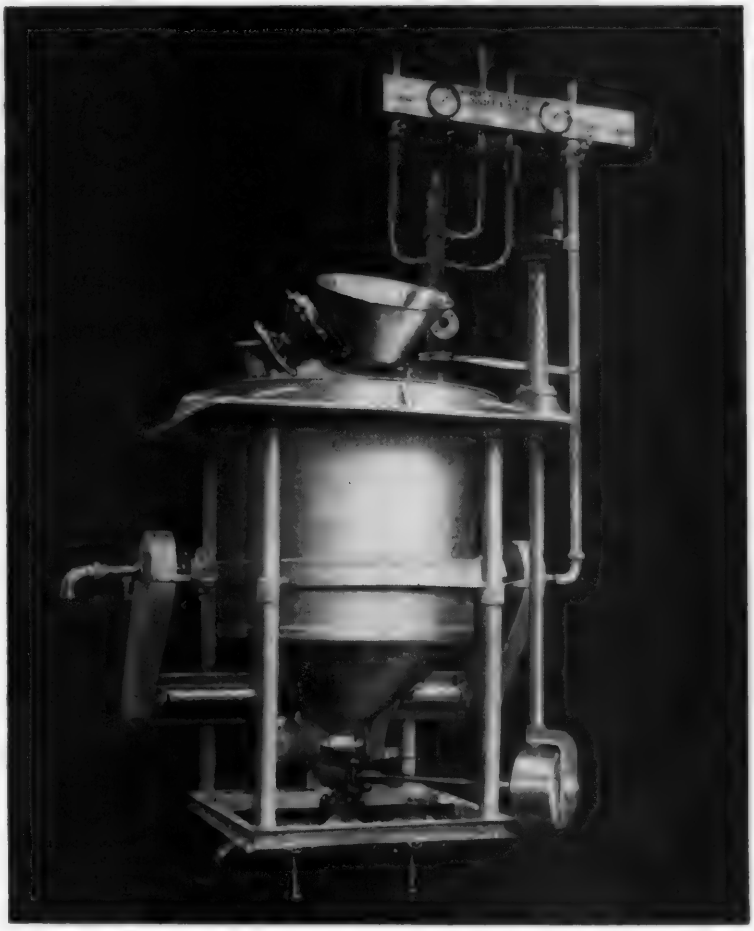

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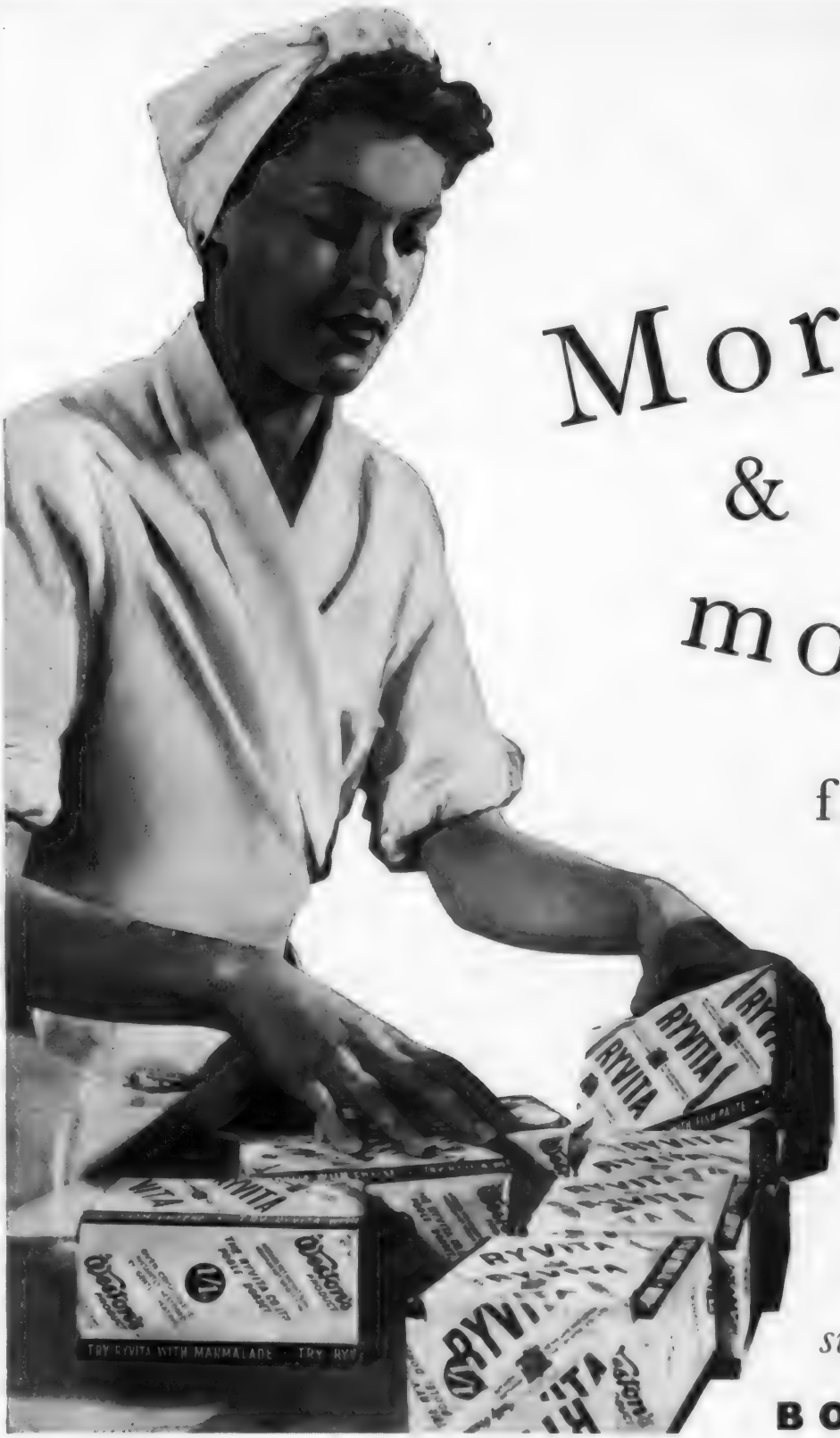

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with different reasons for preferring T & N corrugated containers

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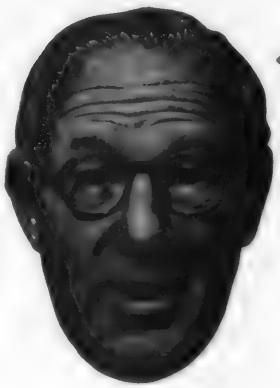
"I have to buy containers that satisfy my three colleagues and many others besides. From T & N I've learned to expect good service, prompt delivery, good quality and ingenious design. And all at fair prices too. They are always ready to advise us about our packaging problems."



HEAD OF DESPATCH DEPARTMENT

"I can double output and cut down packing room costs by using containers from T & N. Packing *or* unpacking is so easy; no straw or shavings are necessary. Each container has fittings 'tailor-made' for its particular job. Containers and fittings collapse flat for economic storage."

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"Because T & N packs are so light they cut down freight costs. Because they are very strong they reduce the risk of damage and loss by pilfering. So you see, we get better returns all round by going to T & N."

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"Customers are always attracted by T & N containers—and they certainly do full justice to the product. T & N design packs in colour to harmonize with their contents and to carry our advertising messages attractively printed on them."

Take advantage of the T & N Advisory Service

May we help to improve your containers or method of packaging? Our experience and expert knowledge is at your disposal—entirely without obligation of course.

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Pioneers of Corrugated Packaging

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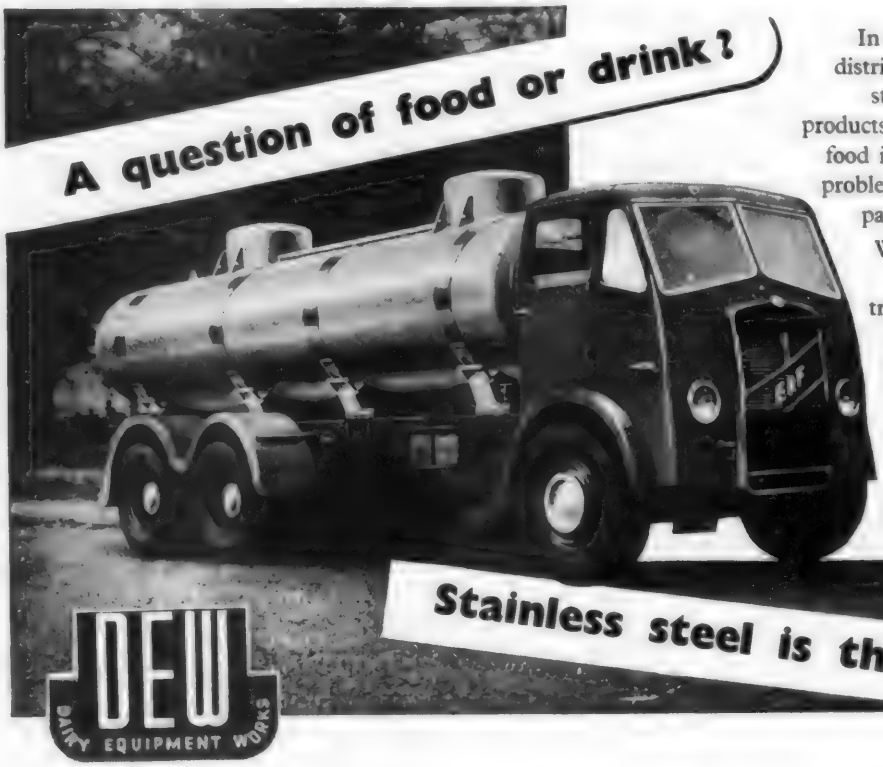

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EVEN MILD CORROSION can cause endless trouble in repairs and maintenance. That's one reason why so many food manufacturers save money and increase efficiency by calling in the anti-corrosion service of the Industrial Division of Semtex Limited.

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The Industrial Division of Semtex Ltd. has evolved new corrosion-resistant cements of outstanding flexibility and adhesion. It has installed floors resistant to fats, greases and corrosive liquors in a great variety of conditions. It has provided flexible *in situ* coatings for the protection of steel and concrete structural members against vapour attack and special tank-linings and pipe jointings for many purposes.

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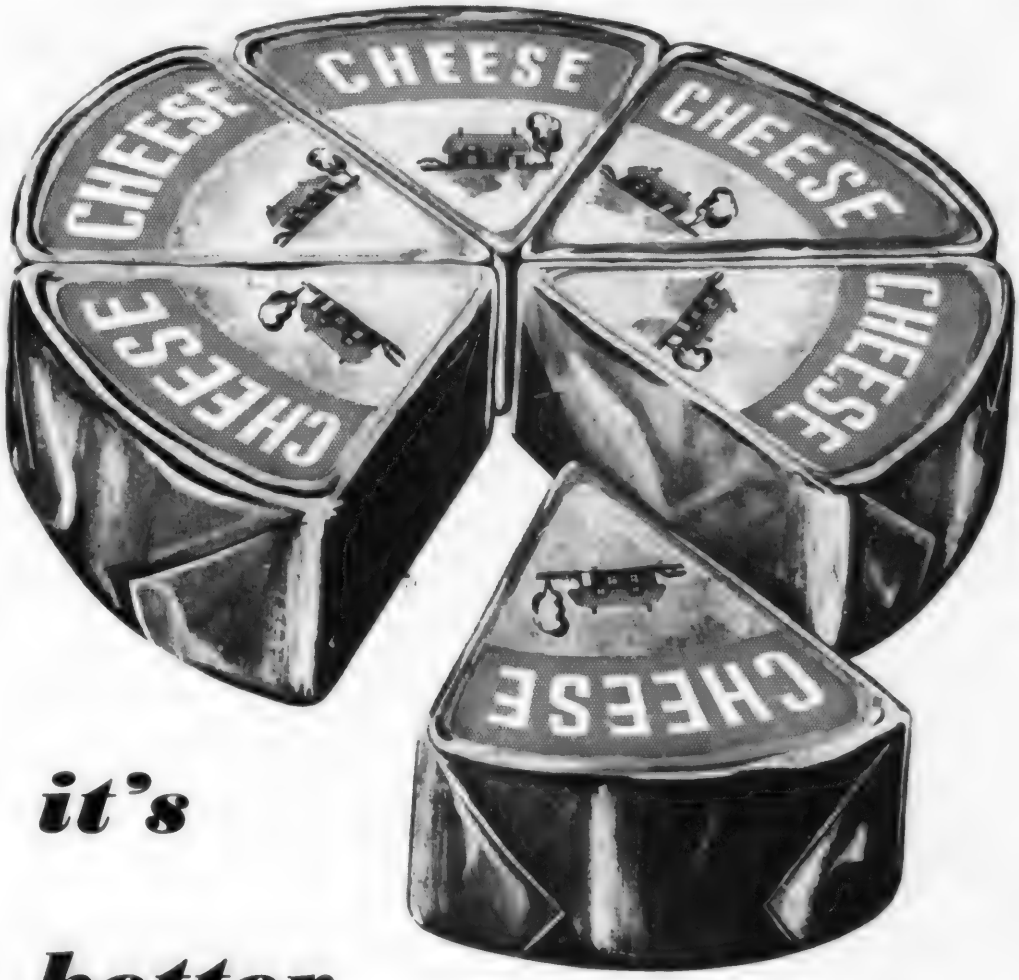

it's better packed in

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FISHER'S FOILS LIMITED, EXHIBITION GROUNDS, WEMBLEY, MIDDLESEX. *Telephone: Wembley 6011*

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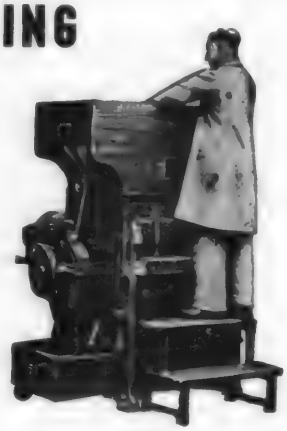
is a modern method designed for extracting dirt and foreign matter and at the same time leaving the article in its ***original*** form and retaining its ***entire*** properties.



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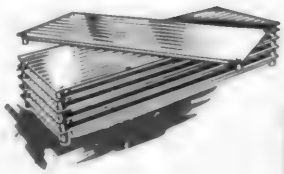

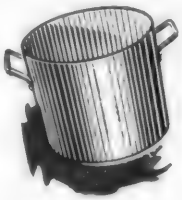

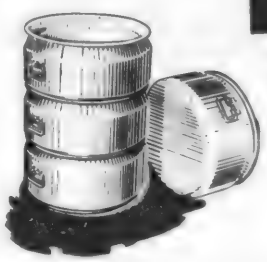

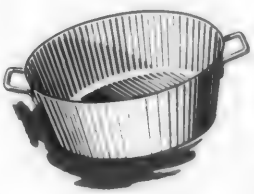

STACKING TRAYS

Those illustrated are 26¾" × 14¾" × 2¼" with special corner stacking features which have concave locating dimples giving greater efficiency.★ Made as pressings from 16-gauge Light Alloy with 1" air space between the trays when stacked. Other sizes and depths of air spaces can be provided. Light, strong, easily cleaned, non-toxic and stable.

★ *Can also be supplied with a depth of 1⅛" (TZ7151) and both types can have the bases perforated with ⅛" dia. holes at ½" staggered pitch.*

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Although many other flavourings have been introduced from time to time, the most popular is still vanilla.

Among the many fine chemicals produced by Monsanto is VANILLIN-MONSANTO, which is used by a large number of food and confectionery manufacturers. It is 100% pure and eminently suitable for adding an attractive flavour to cocoa, chocolate, confectionery, custard powder, ice cream, mineral waters, essences, etc.

Vanillin-Monsanto is made to Monsanto's extremely high standards. Delivery is good.

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Many food products must, by their very nature, be kept fresh by artificial means. It is thanks to the chemical industry that this

is possible without any loss of quality or flavour. Of the few preservatives permitted by law in this country, Monsanto makes SODIUM BENZOATE BP and BENZOIC ACID BP. These, too, are manufactured to the same scrupulously high standards that characterize all Monsanto products — the quality is well within the strict requirements of the British Pharmacopoeia.

Information

The General Chemical Department of Monsanto Chemicals Limited will be pleased to give you further information on any of these products ; a bulletin on Vanillin of interest to food and confectionery manufacturers is also available.

MONSANTO CHEMICALS LIMITED
Allington House
Allington St., London, S.W.1

MONSANTO

In association with:— Monsanto Chemical Company, St. Louis, U.S.A. Monsanto Canada Ltd., Montreal. Monsanto Chemicals (Australia) Ltd., Melbourne. Monsanto Chemicals of India Ltd., Bombay.

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Build your own equipment with

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No drilling, welding, measuring or painting. No scrap

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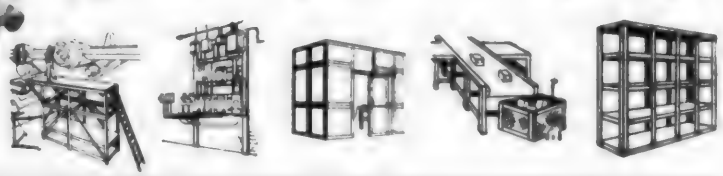

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Advanced design six-cylinder o.h.v. engine developing 85 b.h.p.

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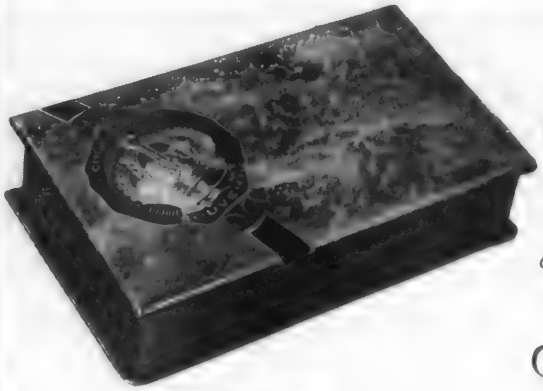

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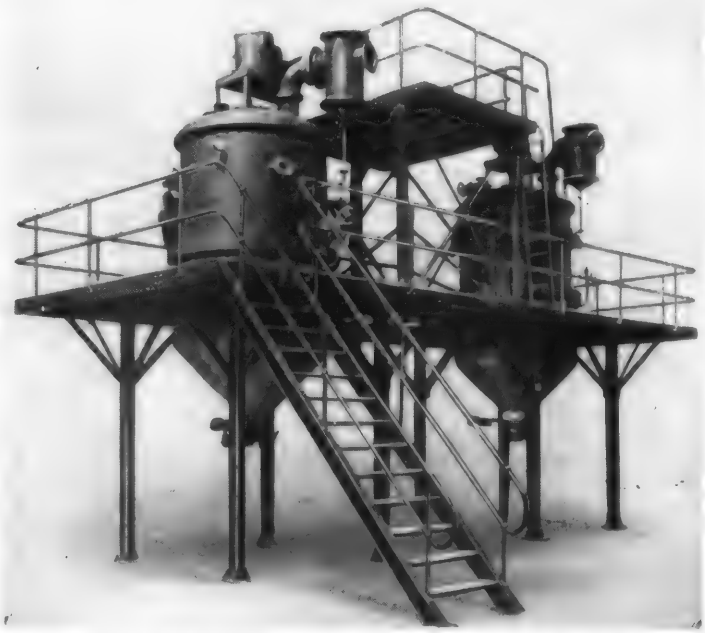

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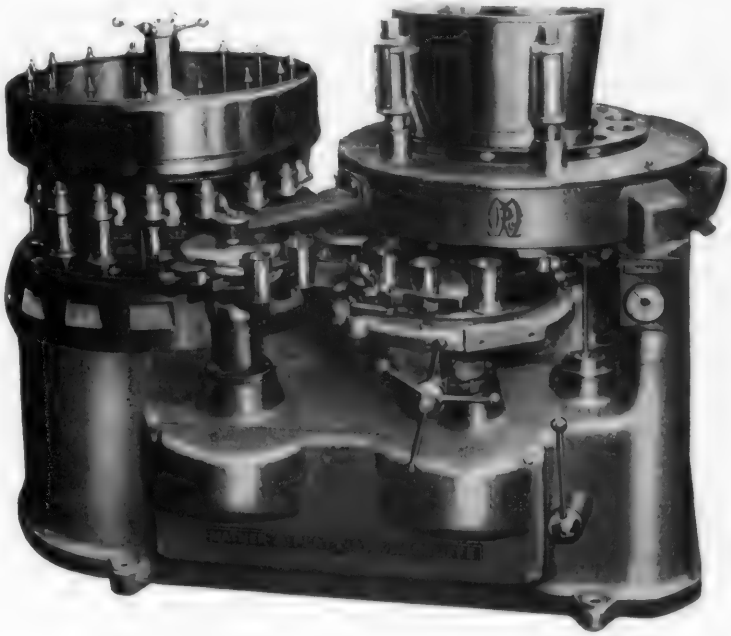

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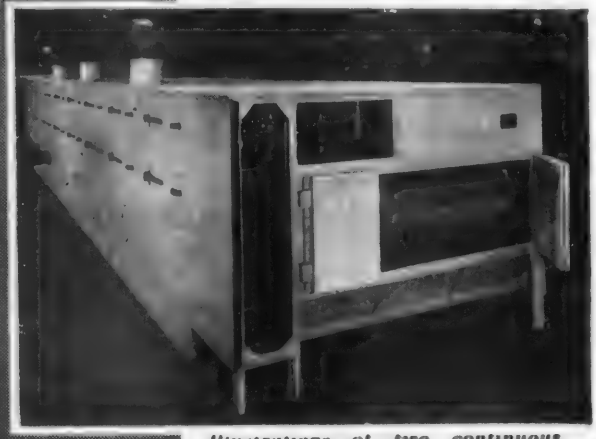

Illustrations of two continuous band dryers for large productions.

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MU52

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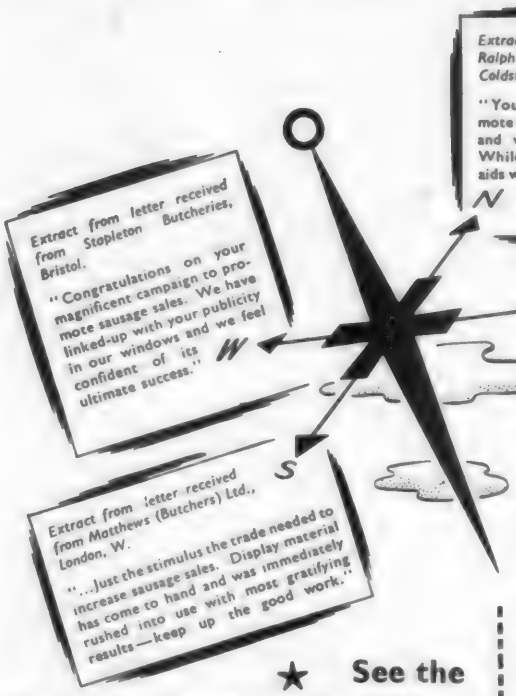
A distinguished name in British Packaging

FROM ALL DIRECTIONS

butchers praise the great "OCECO" PUBLICITY CAMPAIGN


Extract from letter received from Ralph Fairbairn (R. J. Brown), Coldstream.
"Your publicity campaign to promote sausage sales is most timely and we wish you every success. While making use of your display aids we have found enormous interest has been aroused among housewives in this district."
N
Extract from letter received from Stapleton Butcheries, Bristol.
"Congratulations on your magnificent campaign to promote sausage sales. We have linked-up with your publicity in our windows and we feel confident of its ultimate success."
W
E
Extract from letter received from The Pork Shop, Newmarket.
"Results of the sausage promotion campaign so far indicate that you have 'backed a winner.' Any assistance we can give to help in this promotion will be gladly given."
S
Extract from letter received from Matthews (Butchers) Ltd., London, W.
"...Just the stimulus the trade needed to increase sausage sales. Display material has come to hand and was immediately rushed into use with most gratifying results—keep up the good work."

—letters of appreciation come in with every post in praise of the great OCECO publicity drive—share in this big money-making scheme now by ordering the casings with the sales plan.

★ See the **SURPRISE of the Smithfield Show STAND No. 245**

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FM 12/52

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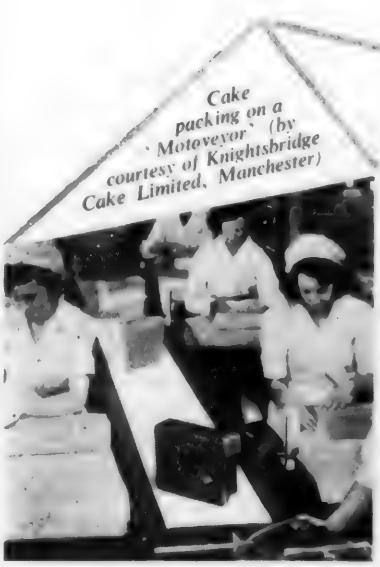
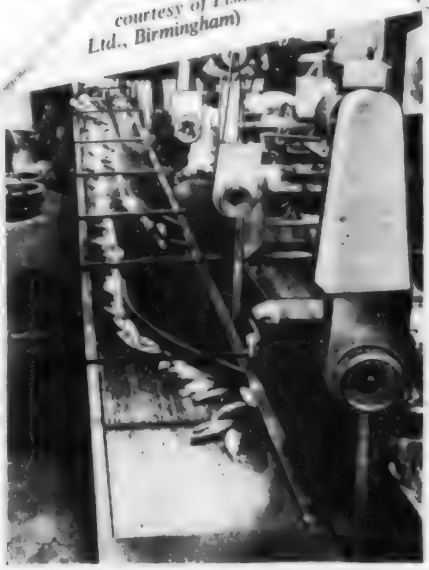
SCANDURA P.V.C. belting

helps the food industry



Cake packing on a 'Motoveyor' (by courtesy of Knightsbridge Cake Limited, Manchester)

Fruit bottling on a 'Motoveyor' conveyor (by courtesy of J. Mawdsley Ltd., Wigan)



Scandura conveyor in a fish canning factory (by courtesy of Fisher & Ludlow Ltd., Birmingham)

As the pioneers of P.V.C. covered conveyor belting British Belting & Asbestos have supplied their SCANDURA belting for many varied applications. Due to its resistance to contamination and its hygienic qualities SCANDURA has become the obvious choice for food conveyor belting. Its lasting qualities had already been proved in food factories two years before its first introduction in Britain's coal mines in 1948, and its fire resistant properties have brought a hitherto unknown safety margin where conveyor fire hazards originally existed. SCANDURA is available now, in varying widths and thicknesses to suit all applications.

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AT

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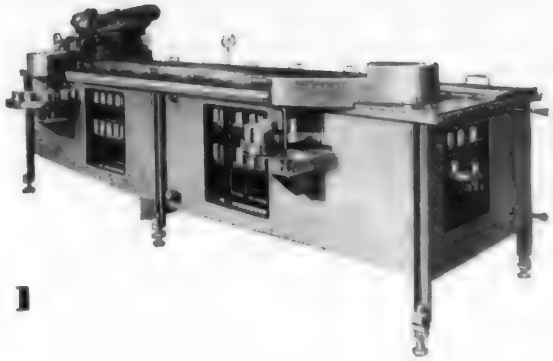

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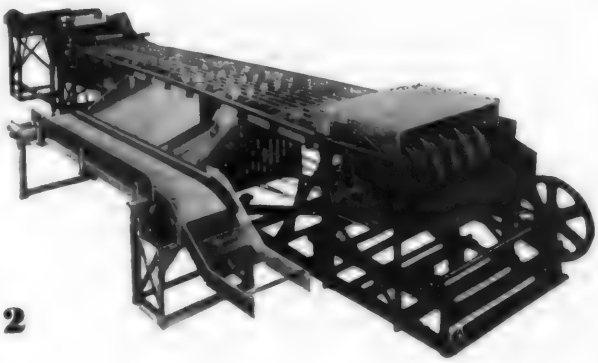

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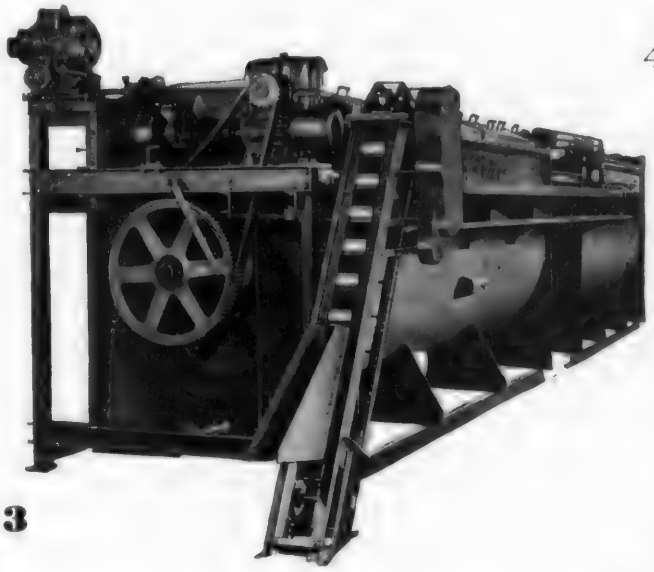

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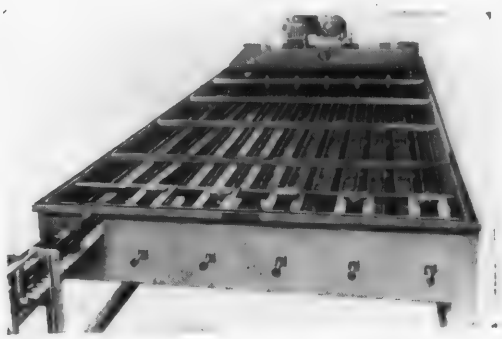

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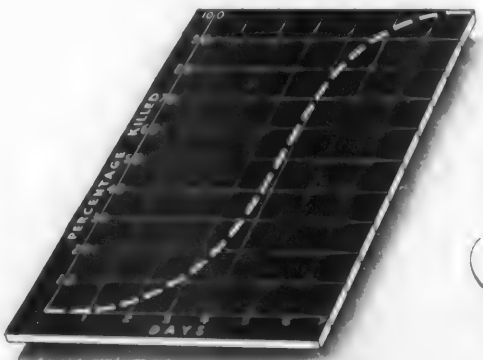

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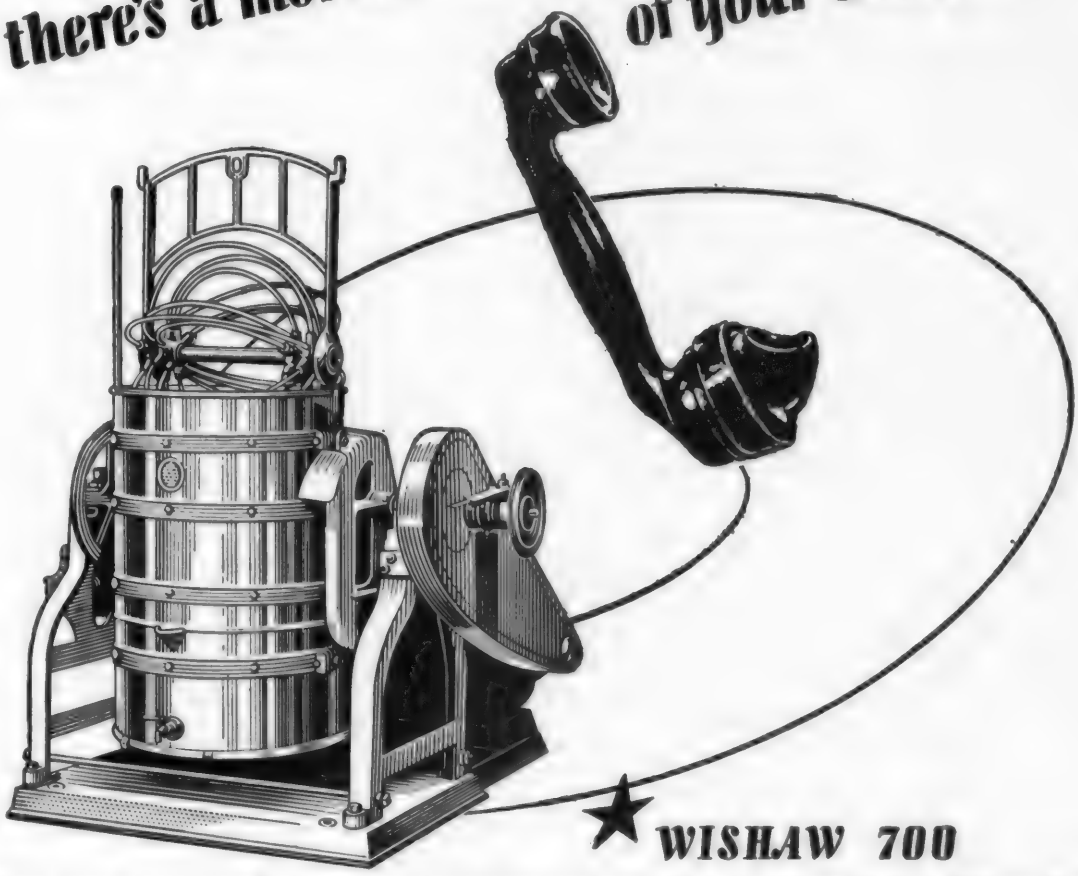

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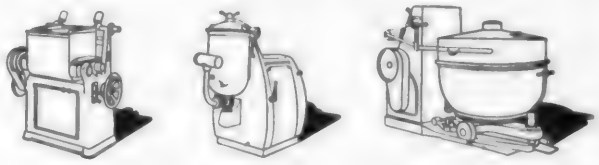

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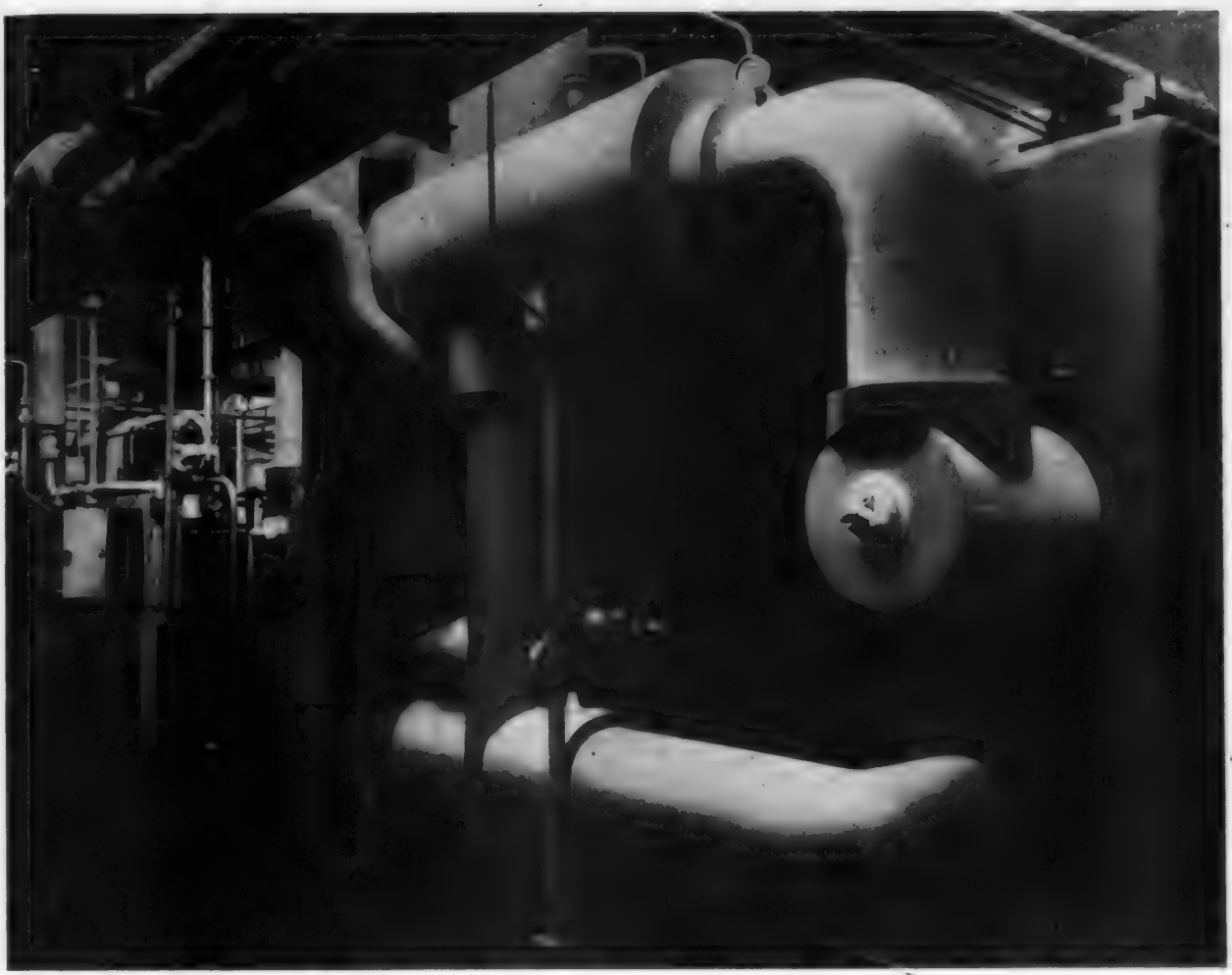

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FOOD MANUFACTURE

Vol. XXVII. No. 12 · Published Monthly · December 1, 1952

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FOOD MANUFACTURE

Vol. XXVII, No. 12 December 1, 1952

British Productivity Council

TO ENGAGE the active interest of industry in the pursuit of high productivity and to give it all possible help in its independent activities are the aims of the British Productivity Council, which has now been formally established. The new organisation is on a broader basis than its predecessor, the U.K. Section of the Anglo-American Council on Productivity, whose work it is taking over as well as engaging in fresh activities.

In addition to representatives of the British Employers' Confederation, the Federation of British Industries, and the Trades Union Congress—the constituent bodies of the A.A.C.P. since its inception three and a half years ago—the Council includes representatives of the Association of British Chambers of Commerce, the National Union of Manufacturers, and the nationalised industries.

Each of the participating bodies will subscribe directly to the funds of the Council. Subject to the approval of Parliament, a Government grant will also be available.

At its first meeting, Sir Peter Bennett was appointed chairman of the Council and Mr. Lincoln Evans was appointed deputy chairman. Sir Peter Bennett was one of the joint chairmen of the U.K. Section of the A.A.C.P. until his appointment (which he resigned earlier this year) as Parliamentary Secretary at the Ministry of Labour. Mr. Lincoln Evans, General Secretary of the Iron and Steel Trades Confederation, was one of the joint chairmen of the A.A.C.P. up to the time of the formation of the British Productivity Council.

On Cleaning Eggs

WARNINGS against the washing of soiled eggs are given by Dr. J. Brooks of the D.S.I.R., Dr. R. Coles of the Ministry of Agriculture, and Mr. N. E. Holmes of the Ministry of Food (*Agriculture*, **59**, 7, 311). Any method of cleaning that involves wetting the shell leads to progressive deterioration during subsequent handling and storage. As a survey by the National Agricultural Advisory Service has revealed that almost 30 per cent. of the eggs produced in Britain are initially soiled and as washing is practically universal as the cleaning method, this information is of the utmost importance.

Where 20 to 30 per cent. of the eggs produced are soiled, the common practice is to wash all the eggs, since this saves the time of separating the clean from the dirty ones. Some producers use soaps, cleaning powders, and detergents; preliminary soaking in water is widely practised. That this is the incorrect procedure has been demonstrated by research in Australia, which has shown that the water in egg-washing machines becomes heavily contaminated with bacteria; in the United States it has been found that in cold storage 10·6 per cent. of washed eggs rotted while only 1·0 per cent. of "dry-cleaned" eggs did so. Perhaps even more significant is the fact that very dirty uncleaned eggs rotted only to the extent of 7·4 per cent. and slightly soiled uncleaned eggs only 1·3 per cent.

Good management can appreciably reduce the proportion of dirty eggs produced, but it is obvious that the problem of the egg with the dirty shell will always exist. If cold storage is not to be associated with appreciable losses, dry or drier cleaning methods must be applied. The use of an abrasive cleaner such as wire wool is recommended; sand used with a clean, moist cloth is likely to be better than any ordinary washing method.

Meat A-Plenty

THERE are indications to suggest that the range of quick frozen meat packs is to be extended by the inclusion of jugged hare, shepherd's pie, Irish pork sausages, canned English shoulder hams, and New Zealand hams. Another group of packers is to market pork chops, mutton chops, prepared frozen soups, curried meat pie, fillet steak, and stewed steak.

Surveys have been made by several of the large makers to determine the scope of outlets, concentrating on those firms with frozen food cabinets. One important point is that a strong effort is being made to keep prices down. The sales of quick frozen food in the past have been handicapped by costs which were higher than many markets were prepared to pay. Packers are also having to face the continued apathy of retailers who have not yet got back to aggressive competitive selling, which is what is needed to put over frozen food.

Egyptian Opportunity

FOLLOWING a seven months' visit to Egypt, an American scientist, Dr. Robert W. Hodgson of the University of California, has recently suggested that it should become the "fruit basket" of Europe. Egypt's fruit growing industry is already expanding steadily and vigorously; if, as seems likely, the new political regime there brings fresh energy and determination to Egypt's self-development plans, the fruit industry, with its promising export possibilities, is bound to be given much attention. At present 150,000 acres are devoted to fruit, particularly to dates, citrus fruits, and mangoes. Among other fruits grown are grapes, figs, bananas, olives, and apricots. The export of mangoes provides a particularly good opportunity for Egypt, which is thousands of miles closer to European markets than the more traditional sources of this tropical fruit.

It is American rather than British guidance that has been leading this industry towards expansion. Egyptian graduates from U.S. agricultural colleges are said to be occupying more and more positions of influence and authority in Egypt's Ministry of Agriculture.

Troubles of a Marmalade Maker

A LADY producing home-made marmalade in a Sussex village has been fined for selling a product which contravenes the statutory standards. It appears that her marmalade contained 64·4 per cent. of soluble solids against the legal minimum of 68·5 per cent.

While under normal circumstances a manufacturer selling a product with an excess of moisture would find little sympathy with the public, one national daily gave considerable publicity to this matter, and denounced the legal standards for jam and marmalade. It was implied that the statutory standards enforced a higher sugar content to the detriment of the quality of the product. This statement is based on the fallacy that soluble solids are equivalent to added sugar. It also implies that the regulations have prevented the lady from producing a popular marmalade with an extra bitter tang.

The standards for jam and marmalade have been recently under discussion and review by the industry and the Food Standards Committee. After a most careful examination of all relevant factors, it was agreed, both by the industry and the Committee, that statutory standards for jam and marmalade are both desirable and necessary for the protection of the consumer. Based on practical experience, these standards are the result of scientific investigation and evidence. They prescribe a minimum content of fruit per 100 lb. of jam and marmalade, the fruit content varying with different varieties of jam. The regulations also stipulate that jam and marmalade must contain not less than 68·5 per cent. of soluble solids. It must be emphasised that these are minimum standards; it is left to the discretion of manufacturers to adjust their formulae upwards.

Contrary to the statements made in the article in question, soluble solids in jam and marmalade are not only composed of added sugar but also of the soluble solids contained in fruit, liquid pectin, and glucose. For practical purposes, it is assumed that sugar contains 100 per cent., glucose 80 per cent., and fruit and liquid pectin 10 per cent. of soluble solids. It is, therefore, obvious that if the fruit content of jam is increased, it is possible to decrease the amount of added sugar accordingly.

It follows, therefore, that the lady was prosecuted for supplying marmalade which contained an excessive amount of moisture, and it is equally a fact that she could have increased the soluble solid content of her marmalade by boiling the water out, without detriment to her recipe.

Sugar Waste into Wool

ONE of the least disposable wastes of the sugar cane industry is filter press mud, about 6 tons of which are produced for every 100 tons of sugar cane crushed. Where the sulphite process is used, the filter mud finds some outlet as a fertiliser; with the carbonation process, however, because the mud has not been satisfactorily developed, it has to be discarded at some expense as a waste effluent.

A process developed by the Shri Ram Institute for Industrial Research, Delhi, converts this filter press mud into a new kind of mineral wool, which is likely to have numerous heat and sound insulating uses in industry. Sand is mixed with the mud, the amount being easily calculable from its silica, lime, and magnesia contents. A small amount, under 1 per cent., of a flux is also required; borax, soda ash, alumina, or several other substances may be used. Furnace heating—oil, gas, or electric arc—to a temperature ranging from 1,000° to 1,600°C. produces a viscous fluid. If this is then tapped off in a thin stream, the impingement of steam jets or compressed air upon this stream will atomise it. The tiny globules are formed into fibres as they pass through a long cooling tunnel. Finally, the mass of fibre-like material is sprayed with a suitable binding agent—some of the modern synthetic resins are satisfactory—and pressed into felts; or the fibres may be made into insulating board.

As the total processing costs are about three times the cost of the raw materials needed, this process does not provide an example of easy conversion of waste into usefulness. Nevertheless, the final product should command a wide demand at a worthwhile price.

Emil Fischer

THE recent appointment of a Canadian professor, formerly a lumberjack, as a lecturer at New Brunswick University, calls to mind the case of Emil Fischer, whose centenary is celebrated this year. Fischer, in his youth, was occupied in the lumber business, but was such a miserable failure that his father (according to his biographers) thought he might as well send him to college.

It would be almost impossible to exaggerate Fischer's genius in carbohydrate chemistry, and in providing that insight into the protein-polypeptide-amino-acid story of digestion and the reverse synthesis. Fischer's work on triphenylmethane dyes and on the organic chemistry of purines, including uric acid and barbiturates, forms two chapters of his history. In the world of food there is much to remember; in particular his war-time contributions and advice on a nation's food, advice not always taken by the German higher command.

He found the key to his brilliant work on carbohydrates when he took phenylhydrazine, a "magic oil" to him, and made the osazones. As for his vital contributions on proteins, these might have been delayed for years had he accepted the £5,000 a year directorship of research offered him by the Badische concern. Thanks to his decision to stay in the academic field, not only was advanced the chemistry of sugars but also of proteins.

Food from Leaves

THE idea of extracting protein from leaves to supplement food requirements is not new, but it is only recently that the techniques of crop husbandry and biochemical engineering have advanced to a degree which makes it likely that such a process could be carried out.

The present proposal, which has been put forward by N. W. Pirie, M.A., F.R.S. (*World Crops*, **4**, 11, 1952), who has long been interested in this process, is a simple one. In any areas with regular rainfall, swampy areas, or areas where irrigation is possible, leafy crops give the biggest return of dry matter per year per acre, and if the crop is well fertilised, the leaf has a high protein content. Instead of feeding this leaf, whether fresh or dried, directly to ruminants, protein could be extracted from it and used for feeding a range of animals, while the residue is fed to ruminants.

The leaves that might be used fall into two categories: those that are at present wasted either wholly or in part and those grown specially for the purpose. With the present prototype machines, 30 per cent. of the protein in good quality leaves from several crops can be extracted in the juice and then separated from it by heat coagulation. The yield can be increased by repetition of the process of grinding and pressing after the addition of water or dilute alkali. When treated in this way a leaf gives the protein, which is suitable for feeding directly to pigs or chickens and after some refinement would be suitable for human beings; the pressed fibre residue, which contains the unextracted protein and is of relatively constant composition, would be used as a feedingstuff for ruminants. Finally, there is the liquor that runs away from the coagulated protein. This contains sugars, salts, amino acids, amides, etc., and is a good culture medium for micro-organisms.

Much research remains to be done; what is needed is an amalgam of logic and crude empiricism. In some countries a beginning has been made on the use of neglected materials, such as corncobs and seaweed, but if the requirements of an expanding world population are to be met, work will have to be extended to more countries and more materials.

Food Handling Study Reduces Costs

As a result of the attendance by a group of employees at a time and motion study course arranged by the Acton Technical College, some spectacular improvements in food handling methods have been achieved. On their return to the factory, the students were able to introduce changes in handling methods which resulted in (*a*) faster delivery of fibre cases to the canned goods labelling department; (*b*) improved handling of coded labels; and (*c*) a more efficient way of handling bottles.

In the handling of fibre cases between stores and labelling lines, the cases were loaded on two hand barrows which were wheeled 272 yards to the production department, unloaded, and wheeled back again to stores. This job employed four men full-time. The cases were unloaded from the hand barrows and stacked on the department floor. Two girls loaded the cases from the stack on to small hand trolleys for transport to the labelling lines.

Following a study of this method on the lines suggested, the number of operations was reduced from five to three.

Compared with four men and two women formerly employed full-time on this job, the new method uses only the full-time services of a man and a woman, with part-time assistance from a fork truck driver. After allowing for equipment cost and depreciation, a net saving of £600 a year is achieved, and workers released from the job have been transferred to more productive work.

In addition to a new method of handling coded labels, which resulted in the saving of £140 a year, a simple piece of inexpensive equipment, used in another department, was designed and has been the means of saving another £1,500 a year. The equipment consists of a stainless steel bar with 13 prongs

and two handles. With this "fork" an operator can lift 10 to 12 bottles at a time in and out of the sterilising tanks. Two girls used to lift the bottles in and out of the tanks two at a time in each hand.

As is evidenced by the foregoing examples, taken from many, the courses conducted by the Industrial Engineering Department of the Acton Technical College, dealing with motion study, time study, job evaluation, incentives, and related aspects of management, are providing valuable service in the development of industrial productivity in the food and other industries.

Calcium in Bread

A NEW survey by the U.S. Department of Agriculture, during which the bread of 41 States was sampled, has shown that in the cities most people can be getting only about 1 per cent. of their daily calcium requirements from bread. Many nutritional experts consider that bread should supply 25 to 30 per cent. of calcium needs; this may be somewhat idealistic, but an actual proportion of 1 per cent. is very poor. The variations in the calcium content of breads sampled were very wide. On an assumed weekly consumption of three loaves *per capita*, some Americans were found to be getting as much as 16 per cent. of their calcium needs. This, however, was the exception rather than the rule.

About one-third of the American breads sampled derived their calcium from milk. As for the remainder, the calcium came from conditioning additives, yeast foods, and sometimes direct fortification.

The position in Britain could hardly be in sharper contrast. Although some people looked upon it as a form of adulteration, the addition of *creta praeparata* to flour was made compulsory at the insistence of the Medical Research Council. Numerous teams of experts have been sent to America to see what can be learned from their products and processes. Perhaps on this matter of calcium in bread there is a good case for a visit in reverse.

Electronic Sterilisation

THE possibility of using high velocity electrons for killing bacteria and other micro-organisms on a commercial scale has been under investigation in the United States for several years.

In Britain, work has been carried out by the Food Investigation Organisation of the Department of Scientific and Industrial Research, with the co-operation of the Radiotherapeutic Research Unit of the Medical Research Council, at Hammersmith Hospital, chiefly on the sterilisation of foodstuffs.

The main advantage of the process is that sterilisation of a wide range of products is possible, within severe practical limits, without the extensive damage associated with heat or chemical sterilisation. There are limited chemical side effects, which are frequently objectionable, but these can be reduced by suitable choice of technique.

It is evident, however, that much more work is required, so far as the food industry is concerned, before its potentialities can be fully assessed. This relates particularly to the nature of the chemical changes which take place during irradiation of complex foodstuffs. The cost factor, especially the initial capital cost, must also be taken into consideration; this is likely to be prohibitive at the present stage of development.

In the pharmaceutical field, however, neither of these limitations is expected to be so great, particularly in the case of chemical compounds of known composition, such as penicillin and other antibiotics.

Admirable Crichtons

THE American custom of calling an undertaker a mortician, a greengrocer a fruitologist, and a sweep a flueologist is probably good psychology. That it has already taken hold over here is exemplified by the use of "cleansing officer" for dustman, while even chemists sometimes rejoice in the name of "scientific officers" or "scientific advisers."

The same idea evidently occurred to Lord Milner of Leeds when, at the Annual Conference of the Sanitary Inspectors' Association, he suggested a change of name for the sanitary inspector. The man in the street, he said, imagines that a sanitary inspector is a man who spends most of his time examining the drains, occasionally sampling the milk, and generally doing a number of disagreeable but necessary jobs. Among the multitudinous matters with which the sanitary inspector is concerned are milk, food and drugs, smoke abatement, slaughterhouses, conditions of work, bakehouses, tents, vans, sheds, vermin, pigsties, offensive trades, "nuisances removal," and drains; it can therefore be realised that to devise a portmanteau title is no easy matter.

The problem is not a new one. One of the earliest suggestions, made in 1849, was "sanitary police," and there followed "sanitarists," "sanitationists," and a number of others, sanitary inspector having been adopted since its use in the 1925 Health Act.

With those of the past, we are at a loss to find another name for these gentlemen, although in view of their many duties, they certainly merit the subtitle Admirable Crichton.

TO AUTHORS

FOOD MANUFACTURE is prepared to consider the publication of articles on the subjects covered. Books on food would also be considered.

British Brisling and Sild Sardine Canning

The British brisling and sild sardine canning industry is almost 40 years old. Starting operations in 1914, with little mechanisation, British Fish Canners, Ltd., now have two factories, one in Leeds and one in Dundee, with a total output of 20 million cans per annum. This description of the Leeds factory will give an idea of the way this is done.

FORTY years ago, imported canned brisling and sild sardine were the only ones obtainable in Britain. At the present time, seven British concerns are engaged in this industry.

Of these, an important group is British Fish Canners, Ltd., whose chairman and managing director, Mr. C. W. Banks, started the industry in Leeds in 1914. He now controls two large modern factories, one in Leeds and the other in Dundee, and also directs the activities of two subsidiary companies, the East Coast Packing Co., Ltd., and the Aberdeen Canning Co., Ltd. Among many other activities, he is a member of the Advisory Council of the White Fish Authority and chairman of this particular section of the Food Manufacturers' Federation.

When the company started operations in 1914, it faced the very severe competition of some 120 Norwegian sardine factories whose output was stimulated by the demand created by the first war. Today, the number of Norwegian factories has increased to 300.

"... quick frozen fish are sometimes defrosted naturally in the open air."

For years these nutritious fish, on which Norway and other countries have built up large and important industries, were used in huge quantities in the U.K. as manure for the land, at a price to the fishermen of less than £1 per ton.

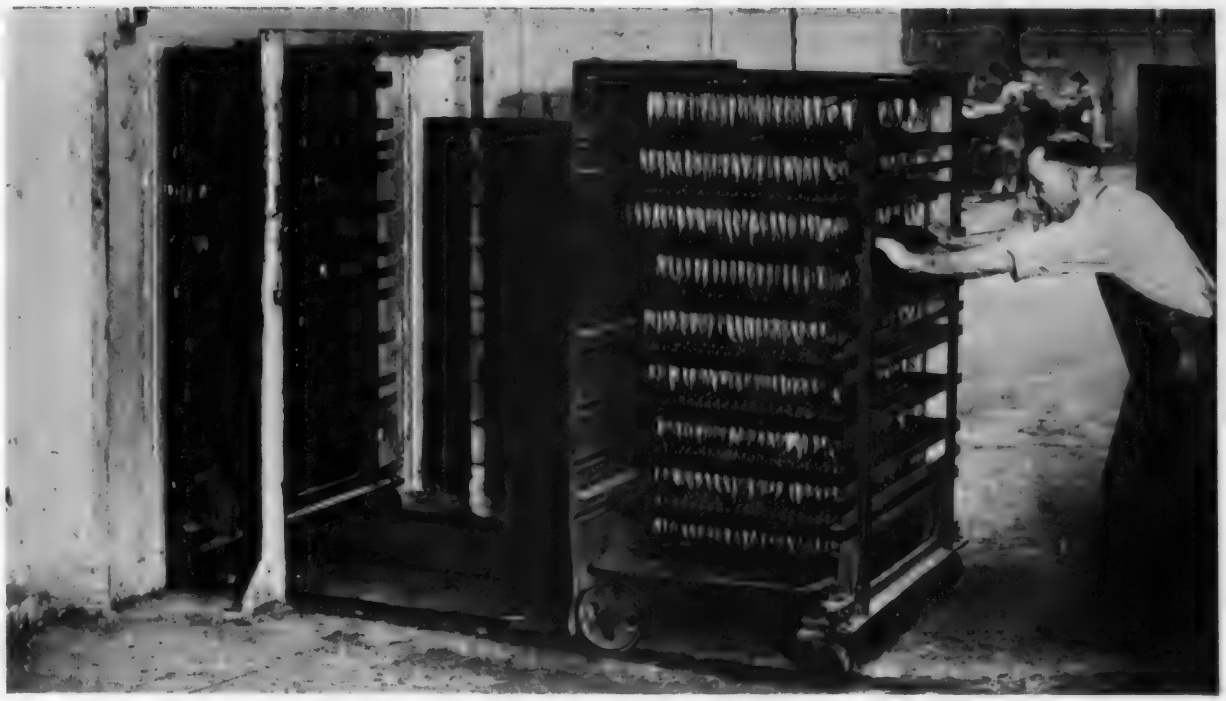
Since the inception of the industry, *pari passu* with the de-

"... The fish are descaled and washed. These two operations are carried out in one machine which consists of a latticed cylinder, slightly inclined from the horizontal, which rotates in a box of special construction where the scales are collected."

". . . The washed and scaled fish are next brined in vats. . . . In order to remove any excess salt solution from the fish, they are drained in baskets following their removal from the brining vats."

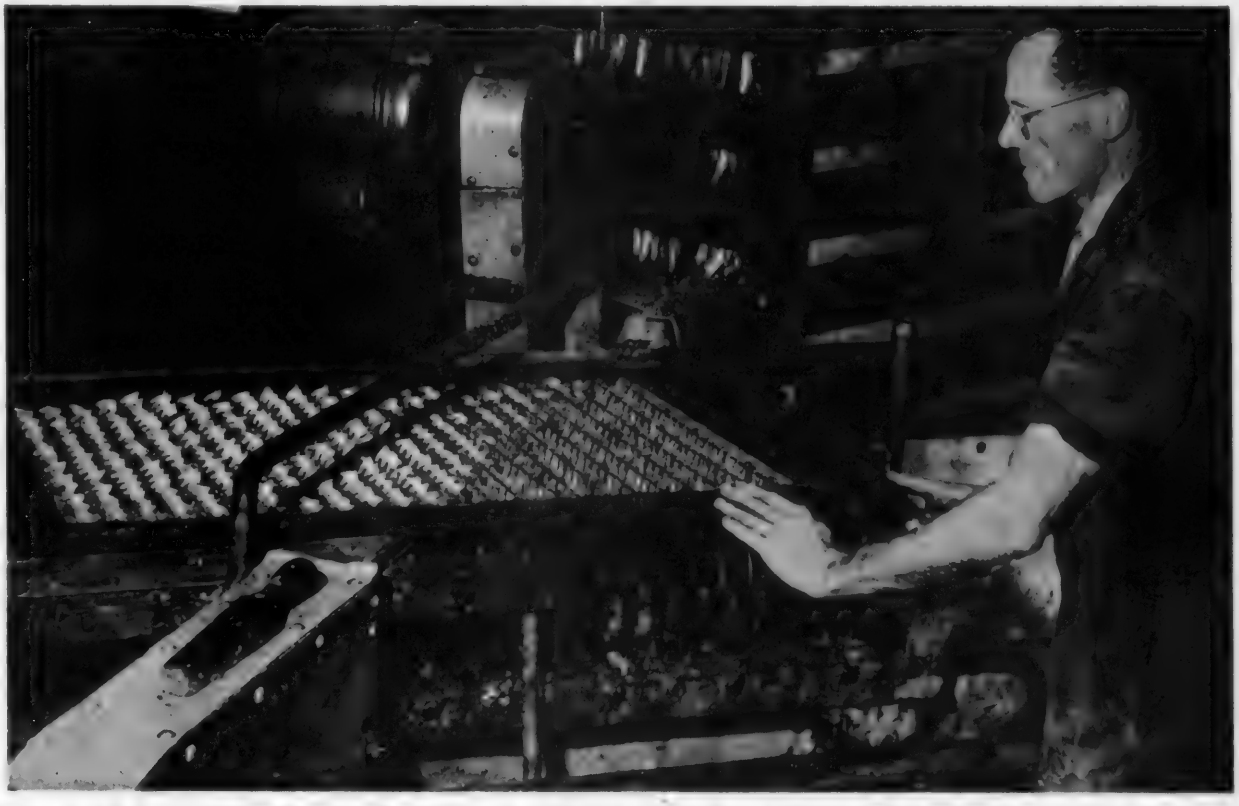
". . . at each table are two workers, facing each other, manipulating the fish into a series of slots, into which the heads are introduced . . . a thin steel rod is used to impale the heads."

". . . The rod, with its hanging row of fish, is fitted in a frame, which is placed conveniently near the rodding table. Each frame has a capacity of nearly 600 fish."



". . . The frames are loaded on to trolleys which are disposed near the automatic smoking ovens."

velopment of modern methods, the production of British Fish Canners has increased each year until it has now reached the vicinity of 20 million cans. In 1940, the seasonal production was handled by five factories, but today a similar output is being achieved by two factories only, the other three having been closed down during the last war. Operations are no longer seasonal and be-



". . . On their removal from the oven, the trolleys of cooked and smoked fish are conveyed to the head cutting machine."

tween the two factories some 600 workers handle one million fish daily all the year round.

The fish for canning reach the factories from Whitstable, Poole, Aldeburgh, Inverness, Southend, Deal, Brixham, Hythe, Brightlingsea, Newhaven, Dundee, Cork, and Donegal. In a number of these places, the fish are quick frozen and stored for handling during the off-season. From October to March, the fresh fish are delivered in four-stone iced boxes and no less than 15 tons daily are canned by the company.

In the case of quick frozen fish, they are sometimes defrosted naturally in the open air, but more often by special temperature devices in a defrosting room, after which they, in common with the fresh fish, are descaled and washed. These two operations are carried out in one machine which consists of a latticed cylinder, slightly inclined from the horizontal, which rotates in a box of special construction where the scales are collected and disposed of to the artificial pearl industry.

Brining Process

The washed and scaled fish are next brined in vats. The details of this process are important, as best results in the development of the final flavour of the product depend upon the strength of the brine, the ingredients used, and the period of time the fish are immersed in it. In order to remove any excess of salt solution on the fish, they are drained in baskets, following their removal from the brining vats; they are then conveyed to the rodding tables.

Rodding may be appropriately called a skilled operation, including

Top left: "**. . . The packing of the fish is an operation that can be done only by hand and very skilful operators arrange them in the cans in neatly fitted symmetrical layers—head to tail.**"

Centre: "**. . . Every tray of packed cans is examined by one of the staff of supervisors and any not conforming to the high standard imposed is rejected.**"

Left: "**. . . The tomato sauce or oil, as the case may be, is introduced by means of specially designed filling machines, which are adjustable to deliver the amount necessary for the size of can.**"

as it does the important job of grading the fish, the dual operation being performed by female operatives. Arranged in the middle of the tables are small piles of fish, and at each table are two workers facing each other, manipulating the fish into a series of slots, into which the heads are introduced. The slots duly filled, a thin steel rod is used to impale the heads. The rod, with its hanging row of fish, is fitted in a frame, which is placed conveniently near the rodding table. Each frame has a capacity of nearly 600 fish. The frames are loaded on to trolleys which are disposed near the automatic smoking ovens.

Automatic Smoking

The use of the new automatic smoking ovens, which show great advance on the old single-handed operation type, has been the means of a marked improvement in the general quality of the final product. Depending on their size, the rodded fish on the trolleys moving through the oven channel take anything between 40 and 75 minutes to remove some of the natural moisture contained in the flesh of the fish, and to absorb from the aromatic smoke the characteristic flavour of the canned product. Fired with oak logs, the automatic smoking oven is equipped with temperature regulators and large fans and flues arranged so that the channel is divided into three compartments, the first for drying, the second for smoking, and the third for cooking, the whole oven continuously dealing with 80,000 fish.

On their removal from the oven, the trolleys of cooked and smoked fish are conveyed to the head cutting machine. The loaded frames are placed upon a conveyor which

Top right: **". . . A large battery of double seaming machines is available for the next operation, each machine having a capacity of from 2,500 to 3,000 cans per hour."**

Centre: **". . . After the next operation—sterilisation in vertical retorts—the discharged cans are conveyed to the washing apparatus."**

Right: **". . . After their journey to the packing room by conveyor, the cans are strip labelled, and wrapped in red or white transparent greaseproof paper, upon which the label is pasted . . . automatic carton sealing machines are used."**

comes into contact with a revolving band knife on the machine which decapitates the fish at great speed.

The machine is adjustable to take different sized fish, and to place large or small numbers of fish on separate trays as required. The decapitated fish fall on these trays disposed on a travelling belt which conveys them to the packing tables. For the most part, the heads are used as an ingredient for fertiliser products.

The loaded trays of fish now pass along the conveyor which runs between two long rows of tables occupied by the packers. The operators take their trays of fish from the travelling conveyor, while a return belt removes the empty trays.

Packing Methods

Of necessity a hand operation, the packing of the fish is carried out by experienced operatives who arrange them in the cans in neatly fitted symmetrical layers—head to tail. Containing the differently graded fish, a large range of can sizes is produced. A small sized can contains 10 fish, a medium sized one from 16 to 18, while still larger cans hold up to 40.

Every tray of packed cans is examined by one of the staff of supervisors, any not conforming to the high standard imposed being rejected.

There are two main packs, one with tomato sauce and the other with edible oil. The tomato sauce or oil, as the case may be, is introduced by means of specially designed filling machines, which are adjustable to deliver the amount necessary for the size of can. In order to be evenly distributed, and so that the oil should not overflow, both the tomato sauce and oil are added in two stages, half before the fish are packed, and half afterwards. Each filling unit has a capacity of 3,000 cans per hour.

Seaming and Sterilisation

A large battery of double seaming machines is available for the next operation, each machine having a capacity of from 2,500 to 3,000 cans per hour. The machines are ranged at right angles to the retort, thus facilitating the loading of the closed cans into them by means of a conveyor, which separates the cans according to size. After the next operation—sterilisation in vertical retorts—the discharged cans are conveyed to the washing equipment.

Washing Full Cans

Can washing is effected by means of the usual type of automatic machine, the cans passing over a conveyor through a tank of boiling solution of detergent, and then through a tank of clean boiling water into a steam heated hot air drying elevator, and thence to tables where a final polishing is given. The cans are then cased up, 100 to each case.

After their journey to the packing room by conveyor, the cans are strip labelled, and wrapped in red or white transparent greaseproof paper, upon which the label is pasted. In all, some 14 different sizes and shapes of can, including the herring pack, are produced.

Can Making Operations

The cans used in the factory are made in the tin box department. Sheets of tinplate, lacquered or otherwise, are first cut into strips in a gang slitter and passed through the oiling machine, where they acquire a thin coating of oil. Deep - stamping presses, some automatic, of high productive capacity, turn out a stream of cans and lids, which are delivered at the ends of the presses, while the scrap metal trimmings fall into the scrap-separating riddlers.

Lids are passed through machines which, by means of heat pressure, affix the rubber ring necessary for the double seaming process. The scrap metal is baled by an appropriate machine and disposed of for detinning. The cans are placed on a conveyor system which delivers them to the packing room as required.

Automatic tray washing, carton sealing, automatic herring gutting, and exhausting machines are used, and it can be said, in conclusion, that no effort has been spared by those concerned in taking advantage of modern developments in plant and equipment and in adopting modern ideas of layout and the comfort of personnel. Lighting and ventilation are of the best and it is a far cry from the days when every fish head was cut off with a pair of scissors, the oil ladled into the cans by hand, and an automatic conveyor was not to be seen.

SUPPLIERS OF EQUIPMENT

Deep-stamping presses: *E. W. Bliss (England); Jos. Rhodes and Co.*
Special machinery and conveyors: *Mather and Platt; John King and Co. (Leeds); Rownson, Drew and Clydesdale; Avenco.*
Tinplate: *Richard Thomas and Baldwins.*
Labels and display cartons: *Brown Bibby and Gregory; Electric Printing Works; Porterprint.*
Retorts: *John Fraser and Son; G. C. Engineering Co.*
Rubber rings: *Poppe Rubber and Tyre Co.*
Cartons: *Thames Board Mills.*
Refrigerating plant: *J. and E. Hall.*
Automatic can washers: *Dawson Bros.*
Can closing machines: *Lubin and Weiffenbach.*
Deodorising plant: *Ozonair.*

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Chemical Manufacturer's Directory of England, Wales, and Scotland, 1952. Newnham. Pp. 193. 8s.

Fenelon, K. G. *Britain's Food Supplies*. Methuen. Pp. 212 +ix. 15s.

Kingzett's Chemical Encyclopaedia. 8th Edition. Edited by R. K. Strong. Baillière, Tindall and Cox. Pp. 1186+ xii. 70s.

The Chemistry and Physics of Macaroni Products

Part V

J. A. Radley, M.Sc., F.R.I.C.

Continuing his discussion on the experimental techniques used in the examination of macaroni products the author, in this instalment, describes how, for the measurement of breaking strength, modulus of elasticity, etc., either tubular macaroni or spaghetti can be used, appropriate formulae being available to convert the results to desired units. For cooking tests, small pieces are the most convenient unless large samples are required for a special test.

BINNINGTON and Geddes[54] describe an instrument for measuring the transverse breaking strength of commercially produced macaroni. The variability of their results is rather high and they concluded it was associated more with variations in internal structure than with differences in wall thickness. They did not, however, condition any of their samples in an atmosphere of definite relative humidity as described previously in the author's method, neither was the manufacturing history of the samples given. They did find, however, that the breaking strength of commercial macaroni was substantially greater than that of experimentally processed material of similar size, which indicates that breaking strength is affected by processing conditions, a conclusion with which the author agrees. A relationship between breaking strength and protein content was indicated, but where varietal comparisons were involved variations in other factors, probably associated with protein quality, obscured the relationship.

Comparative breaking strength studies conducted on macaroni processed from semolinas, farina, and flours of varying extraction prepared from single samples of durum and hard red spring wheat indicate that the breaking strength increases from semolina, to farina to flour. Although the increase in protein content undoubtedly contributes to the trends observed, the large increase in breaking strength of macaroni processed from 50 per cent. patent durum flour, as compared with semolina containing only 0·4 per cent. less protein, indicates the importance of granulation.

The method of Winstone and Jacobs,[55] which is similar in principle to the author's method, has also been previously mentioned.

Cooking Characteristics

Borasio[60] (1935) discussed the cooking characteristics of macaroni products and listed the most important points in this connexion as being:

1. Degree or amount of cooking required.
2. Resistance to disintegration.
3. Water absorbing capacity.
4. Increase in volume on cooking.

A good product of the large type requires a relatively long time to cook, shows a high degree of resistance to disintegration, a large water absorption, and a large increase in volume. Quicker cooking products have been obtained by reducing wall thickness, etc., but such products still show the resistance to disintegration and large increase in volume and water absorption on cooking if properly made with the correct raw products. Borasio cooked 250 g. of the test products in one litre of 1 per cent. salt solution at 105° C. to avoid disintegration by ebullition of the cooking water. The water absorption was determined by draining the cooked product on a Buchner funnel for five minutes, and measuring the increase in weight. He measured the volume increase in a specially designed volumeter and the resistance to cooking by determining the amount of deposit obtained by "settling" the cooking water in a graduated cylinder or evaporating to dryness and determining the residue due to non-salt solids. For a good product, he considers this should not exceed 6 per cent.

A tenderness tester was described by Bonney *et al.* in 1931 for the testing of canned fruits, etc. This device consisted of a plunger, terminating in a circular metal disc, which rests on the sample to which a load is applied at a constant rate by means of mercury until a predetermined reduction in sample thickness is obtained. The weight of the mercury is taken as the index of tenderness.

Binnington, Johanson, and Geddes[56] used a similar but more elaborate apparatus and found that a definite optimum time of cooking appears to exist beyond which excessive softening results. At least five tests on a single cooking are required to get a fair average. Standing in water for about 30 minutes at room temperature after cooking does not affect the tenderness, nor does a small variation in macaroni temperatures. Salt in the cooking water was found to result in increased tenderness for a similar cooking time.

Wet Weight and Volume

The above-named workers found a very close relationship between the wet weight of the cooked product and the volume, so that the latter can be accurately predicted from the former. Harris and co-workers[11-13, 57] used cooking tests to detect differences between durum wheats and to follow the effect of blight or damage on cooking quality, using the above techniques.

Studies on damaged wheat were carried out on samples made by blending sound and damaged durum. They found cooked weights varied from 314 to 374 g. Tenderness generally averaged 96·3; residue 3·5 to 3·9 per cent. Yearly variations in these values exist, but the varieties are affected in different ways in respect of

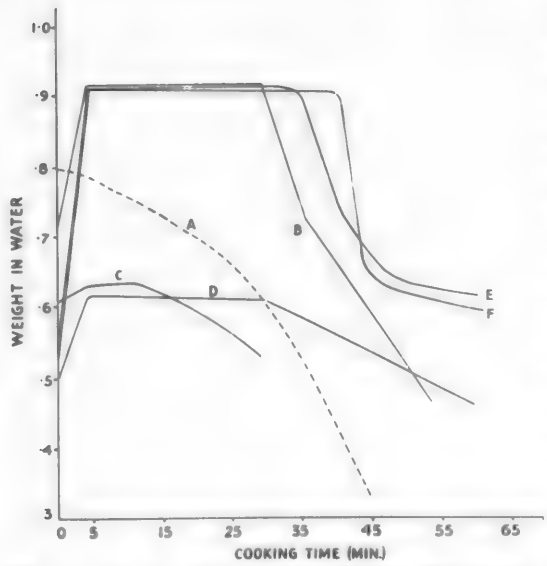

Fig. 1. Loss of weight in water showing disintegration point of paste goods.

these changes. Heavy damage affects grade, the damaged wheat reducing the cooked weight and tenderness score. The amount of residue is increased by infection, heavy infection giving heaviest residue. Cooking quality apparently bears no relationship to colour (the accepted criterion of macaroni value).

Benham[58] found that the degree of cooking of a starch or starch cereal is measurable by a method based on the alkali labile value. This value depends on the early depolymerisation of starch due to rupture of the granule accompanied by a slight amount of degradation. The alkali labile value rises as cooking progresses and finally levels off when the cooking of the product is complete. This method may well be applicable to following the cooking characteristics of macaroni samples.

Modified Cooking Test

The author has introduced a modified cooking test which has given valuable information on the behaviour of various products on cooking. From this test the increase in weight of the cooked macaroni product can be accurately determined and also the point in cooking time at which disintegration commences, and, thereafter, the rate of disintegration.

Three g. of the product are weighed and put into a wire basket having a loose fitting gauze lid and the whole weighed. The basket and sample are then weighed in cold water at 20°C. and immediately after weighing are plunged into boiling water for a given period of time. Exactly to time, the sample is removed and immediately re-weighed suspended in cold water. Having taken the weight, the basket and macaroni are removed, swung to remove excess moisture, the outside of the basket dried with a cloth and the basket, with its contents, again re-weighed in air. At the end of this weighing, it is replaced in the boiling water and the whole operation of cooking, weighing in water, weighing in air, etc., repeated until the macaroni completely disintegrates.

The basket is also weighed in water and thus from the weighings obtained it is possible to calculate the weight of macaroni in water. Fig. 1 shows the type of result obtained with macaronis and spaghettis, when the apparent weight in water of the sample is plotted against the time of cooking.

The initial rise in all the curves in the first few minutes of cooking has not been explained satisfactorily, but it seems possible that it is caused by the driving out of air from minute bubbles present in the samples, thus decreasing the buoyancy, *i.e.* increasing the apparent weight. After the initial rise, it will be seen that the apparent weight in water remains constant, but that later all the samples commence to disintegrate and the material shed by any sample is reflected in the downward curve. The rate at which disintegration proceeds is shown by the steepness of the curve. The steeper the curve, the more rapid is the disintegration.

In Fig. 1, curves A and B are samples of thick sphaghettis from the same manufacturer. Curve B gives the normal production, curve A showing the cooking behaviour of a very bad batch produced when certain operational troubles were experienced. The uncooked appearance was somewhat similar, although it was suspected that the material was faulty. It will be seen that the bad material commenced to disintegrate immediately cooking was started and, indeed, it soon resulted in a pasty mass.

Curve B shows that the normal material is stable for 33 minutes' cooking time, thereafter commencing to disintegrate. Curves E and F show the cooking properties of two batches of material from the same manufacturer, taken from ordinary production at different times; these indicate a stability of between 38 and 45 minutes' cooking before disintegration commences and also that the plant process is under control.

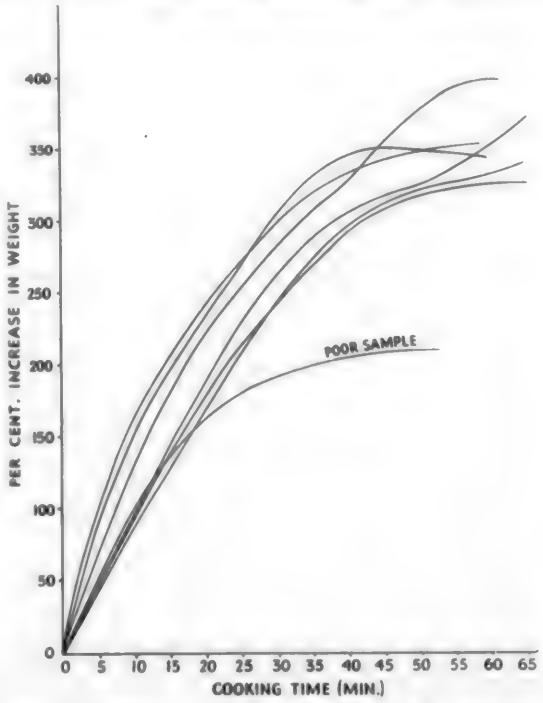

Fig. 2. Increase in weight with cooking time of macaroni.

Curves C and D show the results obtained from two thin spaghettis from another manufacturer, again when trouble was experienced. Curve C is that of the bad batch, while curve D shows the normal behaviour; again it will be seen that the very much greater stability of D on cooking is immediately indicated by the curve.

Fig. 2 shows curves obtained by plotting time of cooking against gain of weight in air, and it will be seen that these may vary from 300 to 400 per cent. The better samples show the greatest increase, while tenderness tests indicate that optimum tenderness occurs when the material is almost fully swollen.

The slope of the curves gives some indication of the speed of cooking, and shows this to vary somewhat with the manufacturing process, which introduces slight variations in wall thickness. Fig. 3 shows the increase in weight in air, and therefore increase in volume with cooking time of various small goods and spaghettis. It will be noted that the weight increase proceeds more rapidly with the smaller goods than with macaronis, but that the final volume is not as great. This is because the thinner material is more readily penetrated by water and therefore can cook quicker than with thick-walled material, while disintegration commences at an earlier stage. The earlier disintegration is brought about by a combination of circumstances, the chief being that the material is more quickly brought to the cooked state and that lower pressures are used for extruding such small goods than for long goods.

Optimum Cooking Time

Work in the author's laboratory indicates, in general, that every manufacturer's macaroni made from durum wheat swells approximately to the same extent when completely cooked, provided it is properly made.

However, owing to variations in wall thickness, various macaronis and spaghettis differ in the time required to swell to the same extent on cooking, although in many cases these times are very close indeed. From this, it follows that each manufacturer should determine for himself the optimum time of cooking for his own product and, incidentally, this work indicates that the fixed figure given as the cooking time for macaroni by the Ministry of Food is inapplicable in a number of cases.

The author has compared a number of Swiss, Canadian, and American samples of macaroni and spaghetti with some British products; the latter were inferior only in their colour in the raw and in freedom from specks, but were equal in all other respects such as tensile strength, cooking characteristics, etc. In general, British macaroni swells as much on cooking as Swiss, Italian, American, and Canadian samples which have been examined, but in some cases, disintegration was more marked; this would appear to be due to the processing operations rather than to the raw materials used.

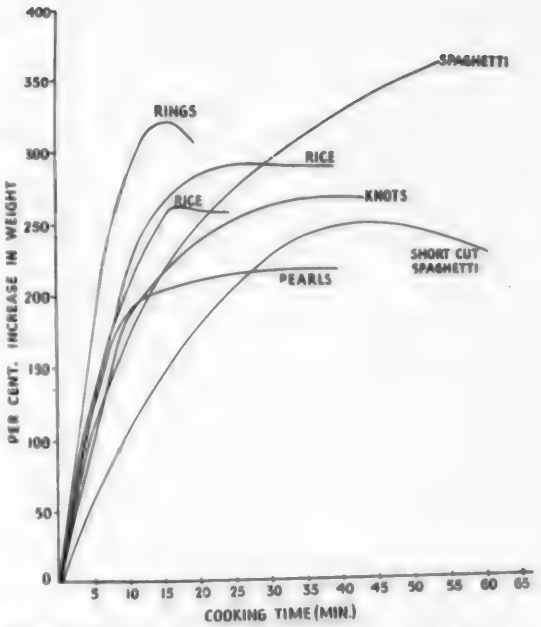

Fig. 3. Cooking curves for miscellaneous paste goods.

Temperature of Cooking

The author has found that macaroni can be cooked at temperatures below that of boiling water, but that for each five degrees drop in temperature of cooking, the product cooks slower, as might be expected, and also swells less; thus a product cooked at 80°C. swells only half as fast as that cooked at 100°C. and finishes with an increase in volume, or weight, only half that obtained at 100°C. Intermediate cooking temperatures give intermediate swelling behaviours between these two extremes.

This behaviour is very possibly connected with the swelling behaviour of wheat starch, since this starch, on heating in water, commences to gelatinise at about 65° C., and after many of the large and intermediate sized granules have fully swollen, the curve of "percentage granules gelatinised/temperature" flattens out, showing that, until a temperature of about 90°C. is reached, many of the smaller granules resist gelatinisation. At about this temperature, these in turn commence to gelatinise, but to gelatinise completely every granule, prolonged boiling of the starch paste is required.

Thus, in macaroni cooked at 80°C. there is a large number of the smaller granules of the starch present, which are not contributing effectively to the imbibition of water; hence the volume does not increase beyond a certain point. These tests also tend to indicate the desirability of the practice of adding salt to the cooking water so that the latter should really attain to at least 100°C., thus giving quicker cooking and reducing the development of "sliminess," *i.e.* disintegration on the surface of the product.

Milling Procedures

A semi-micro procedure for milling durum wheats requiring only 300 g. of grain has been described by Fisher and Meredith[61] which is claimed to give results in excellent agreement with those obtained by macro-milling.

C. C. Fifield, G. S. Smith, and J. F. Hayes[26] were among the

first who discussed the experimental equipment and methods of macaroni manufacture, while D. S. Binnington and W. F. Geddes[27] also described experimental milling and processing apparatus, and later[27] showed significant differences in macaroni colour and appearance among many durum wheat samples. In 1939, they further showed that macaroni quality cannot yet be predicted from any single analytical test applied to wheat, and that wheat carotene is valueless as an index of macaroni colour, particularly for intervarietal prediction.[29]

Laboratory Scale Manufacture

The micro-apparatus of Harris and Sibbett[59] comprises a macaroni mixer, kneader, and press, mounted on a common table, driven by a 1½ h.p. motor, the set-up closely resembling the one described by Fifield *et al.* and by Binnington and Geddes.

The drying cabinet is modelled on the one described by the latter workers, except that no refrigerating unit was included to aid in removing moisture from the air within the cabinet. A small vent in the system is gradually opened to permit the moisture-laden air to escape. The interior of the drier is copper-lined. A 192 watt heater, thermostatically controlled, holds the temperature constant during drying, the control bulb of the thermostat being placed in the air stream coming directly from the humidifying and heating chambers.

A variable resistance boiler, of the type described by Binnington and Geddes, is used as a source of moisture, a vacuum tube relay being used to control the input of current to the boiler. This relay is connected to the wet bulb pen of the Taylor temperature recorder, and functions by permitting the electric current to pass directly to the carbon electrodes of the boiler when it is necessary to raise the humidity of the cabinet. When the cabinet humidity has reached the desired point, the current is shunted to the boiler through a resistance lamp bank. Under these conditions, sufficient heat is generated by the reduced current to maintain the water in the boiler just below the boiling point.

During mixing, kneading, and pressing, the relative humidity of the room is maintained between 55 and 60 per cent., and press temperature at 92°F. They use a thicker die than is usual and have the centre rod aligned by three knife edges instead of the one usual in experimental dies, to prevent the possible displacement of the centre rod during pressing, with resultant variations in wall thickness.

In processing, to 600 g. semolina of 13·5 per cent. moisture content is added sufficient water to form a thick dough; the semolina and water are then mixed and kneaded to optimum consistency and, after resting for 10 minutes, pressed. The 30 inch lengths of macaroni are suspended over a wooden rod and surface dried at room temperature in a current of air from a fan, then placed in a drying cabinet, where they are sweated for a minimum period of one hour at 90°F. and R.H. 95 per cent. Drying is done at a constant temperature and under a falling R.H. gradient, dropping to R.H. 35 per cent. in 64 hours. Visual colour score is determined under a mercury fluorescent lamp.

Significance of Protein Content

Data on effect of protein content, agronomic history, infection, and variety on quality are given in their paper. Wheat protein and semolina protein are very significantly correlated. Wheat protein and semolina absorption are also positively and significantly correlated. This is interesting in showing that semolina milled from relatively high-protein durum wheat will take more water to produce a dough of standard consistency.

The relationship between the semolina speckiness and visual macaroni score was also determined; a significantly negative correlation was found between these variables, but the magnitude of this correlation was not sufficiently great to be of marked utility in predicing one variable from a knowledge of the other.

Another experimental apparatus has been described by Martin, Irvine, and Anderson.[12] This consists of a U-shaped mixing trough with a horizontal spindle carrying four motor-driven blades, the whole immersed in a constant temperature bath; a kneader consisting of an upper corrugated and a lower smooth roll; a cylindrical press, adapted from a Carver press in which the dough can be rested under pressure, and subsequently extruded at a rate of 36 inches per minute through a single-holed die, maintained at 40°C. by a heating plate; and a drying cabinet fitted with thermo- and humidity controls, in which were dried the 30 inch strands obtained from each 50 g. sample of semolina.

A great deal of work has been carried out on laboratory scale plant, much of it being directed towards the examination of small samples of wheat in the early stages of breeding experiments in order to select suitable strains for further tests. Great emphasis has been laid on colour, but little appears to have been directed towards improvement of machine design or towards the addition of other components to the mix to improve the characteristics of the final product. This is undoubtedly because most of the work has been sponsored by and carried out in the laboratories of Government institutions interested in the broader aspects of national agricultural policy.

Advantages of Micro Method

One important point emerges from all the experimental work on the micro technique, and that is that the micro method is far more reproducible than the macro method. This will be readily understood since the degree of control at all stages is much closer for the former than for the latter. In the micro method it is possible to control and vary all the conditions in the processing operations. All these factors are directly under the control of the operator and can be held within very close limits. More uniform conditions are attainable in the drying, owing to the small size of the cabinet used. From this it would appear

(*Continued on page 486*)

International Symposium on Nutrition

The symposium on "Present Problems in Nutrition Research," held in Basle from October 1 to 4, 1952, under the auspices of the International Union of Nutrition Sciences, owes its inception to Prof. F. Verzár of the Institute of Physiology in the University of Basle, who, together with his colleagues, in particular Prof. K. Bernhard of the Institute of Physiological Chemistry at the same University, and the Basle publishers of *Experientia*, must also receive credit for its organisation. Generous financial support was given by a number of Swiss firms.

THE occasion was the first on which German and Italian nutritionists were able to exchange freely their views with those from allied countries in Europe. In all, there were representatives present, during the whole or part of the symposium, from Belgium, Denmark, Finland, France, Western Germany, Haiti, Iran, Italy, Jugoslavia, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, the United States of America, and observers from two United Nations agencies, FAO and WHO.

As the papers and discussions are to be published as a special supplement to *Experientia* early in 1953, it is not proposed here to do more than indicate the general scope of the programme.

Choice of Foods

The introductory address by Dr. J. Trémolières (Paris) on the choice of foods, was perhaps as all-embracing as any single contribution, although a subsequent paper by Prof. H. Kraut (Dortmund) also led to a broad discussion, opening out from the problem of calorie intake and output among heavy manual workers. At the same session, the papers by Prof. A. I. Virtanen (Helsinki) and Dr. D. P. Cuthbertson, Director of the Rowett Research Institute (Aberdeen), although different in content, were allied in underlying interest, dealing with the bases respectively of natural foodstuffs for nutrition and digestive microbiology.

Subsequent sessions included a number of papers on more specialised or even technological subjects, such as methods of estimating free and combined amino acids in foodstuffs, contributed by Prof. E. J. Bigwood (Brussels) from his own investigations, and changes in protein on storage and aspects of the metabolism of natural and synthetic fats, by Prof. K. Lang (Mainz) on the one hand and Prof. K. Thomas (Göttingen) and Prof. K. Bernhard (Basle) on the other.

Toxic Substances in Food

The paper by Dr. A. Schürch (Montreal and Zurich) on toxic materials occurring in polymerised oils led naturally to what proved to be one of the most polemical subjects raised, when Prof. O. Högl (Berne) and Prof. E. Abramson (Tomteboda) discussed the presence, by addition or accident, of toxic substances in food. The discussion of this paper had to be continued at a subsequent session.

Vitamins and Antivitamins

The next session was concerned with certain of the vitamins and, incidentally, antivitamins. In it the comprehensive survey by Dr. L. J. Harris (Cambridge) and an account by Prof. H. Dam (Copenhagen) of some of his own work on vitamin E played a prominent part, supported by contributions from Dr. T. Moore (Cambridge), Dr. S. Markees (Basle), Prof. J. Kühnau (Hamburg), and Dr. J. C. Somogyi (Berne). Somewhat apart from the main thread of this session were the papers by Dr. S. J. Folley (Reading) on thyroid feeding of dairy and other animals and by Dr. A. B. L. Beznák (Birmingham), whose slightly unconventional paper was concerned with "Dietary Fat, Work, and Growth." Cortisone was also discussed during this session by Dr. S. G. Greenberg (Birmingham and Los Angeles).

At the final session, which was over in time for the adjourned discussion on additives, mineral matters were presented by Prof. H. D. Cremer (Mainz) and Prof. V. Demole (Lausanne), the latter referring specifically to fluorine and thus leading up to the contributions by Prof. T. Gordonoff (Berne) and Prof. A. J. Held (Geneva). Owing to the absence of Dr. A. G. van Veen through illness, his and Dr. W. R. Aykroyd's papers on the work of FAO were condensed into one and admirably presented by Dr. Aykroyd, Director of its Nutrition Division in Rome.

Social Aspects

It will thus be seen, both from the matters discussed and the names of the contributors, how wide the symposium ranged in time, space, and matter. Nor did those present overlook the social aspects of such an international gathering, whether at the informal conversazione with which it began, the reception at the City Hall by the Director of Education for the City of Basle on behalf of his Council, or the dinner at the famous Schutzenhaus Restaurant, surrounded by the evidences of marksmanship through several centuries. Perhaps, though, it would be fair to say that the renewing, cementing, and creating of friendships were most actively pursued at the informal lunches, which took place between sessions mainly in one restaurant near to the *Kollegienhaus* of the University, the headquarters of the symposium.

Plans for the Future

Members of the Committee of the International Union of Nutritional Sciences were not even able to rest at the end of the Saturday afternoon session, for its energetic secretary, Dr. L. J. Harris, had

called a meeting to follow immediately. This meeting was attended by representatives from Belgium, Canada, Denmark, Finland, France, Germany, Italy, Jugoslavia, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States of America, as well as by observers from FAO and WHO, from the Scottish Group of the Nutrition Society, and from the International Dietetic Congress.

It was reported that affiliation to the Council of International Organisations of Medical Science was formally completed and that a renewed application had been made for affiliation to I.C.S.U. It was proposed that symposia in India (Coonoor) and Amsterdam should be held under the Union's auspices, as had been the highly successful one just ended. In particular the Netherlands' representative offered hospitality for another specialist symposium in the summer of 1954. The Committee also agreed to accept the recommendations of the Commission on Biochemical Nomenclature of I.U.P.A.C. about certain water-soluble vitamins. Prof. E. J. Bigwood and Dr. L. J. Harris were re-elected to the Chair and the Secretaryship, respectively, of the International Union.

The Chemistry and Physics of Macaroni Products

(*Continued from page* 484)

that for any one factory to reproduce a standard product, the strictest attention must be paid to controlling all variables within very narrow limits. Some attention to instrumental control and plant design is therefore desirable, although some manufacturers may already be well advanced in this.

(*To be continued*)

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Electricity and Productivity

A STRONG plea for greater production in order to cope with overseas competition was made by Mr. A. R. W. Low, Parliamentary Secretary, Ministry of Supply, at the two-day conference on industrial productivity, organised by the British Electrical Development Association, and held under the Presidency of Dr. Percy Dunsheath, C.B.E., M.A., M.I.C.E., M.I.E.E.

Mr. Low spoke of the increase in productivity that had taken place from 1947 to 1950, but which had been slowed down since the beginning of 1951 by the switch to defence production of a large part of the metal using industry. Scarcity of many important raw materials had upset the rhythm of production, but there were signs that raw material supplies, particularly steel, were improving.

In connexion with the problem of shortening the time of production, it was necessary to remove the fears of those who thought that the effort of getting new plant might be too great or that the adoption of technical changes would put people out of work.

More mechanisation and power was the theme of the address by Sir Norman Kipping, Director General of the Federation of British Industries, who said that higher productivity alone could produce higher standards of living.

A tribute to the electrical equipment manufacturing industry, which was making an important contribution to the progress of the nation in the broadest possible way and, in particular, to the productivity of industry in general, was paid by Col. B. H. Leeson, O.B.E., President of the Institution of Electrical Engineers and director of the British Electrical and Allied Manufacturers' Association.

The help that could be given to lift Great Britain out of her economic difficulties by the Trade Union Congress, the Federation of British Industries, and the British Employers' Confederation in stressing the need for equipment to be used for a longer period of the day than was possible with the normal working day, was emphasised by the Rt. Hon. Lord Citrine, chairman of the British Electricity Authority. Between 1947 and 1951 America commissioned 26,621 megawatts of installed capacity while in Britain the figure was 4,001. Thus the gap between the electrical horsepower available to the American worker and the British worker was widening rapidly. In such conditions, it was not possible for the British worker to compete effectively in foreign markets with the American worker. The only answer was an increased and adequate supply of electrical plant.

A campaign to electrify the factories of Britain in order to bring lasting prosperity was outlined by Mr. V. W. Dale, general manager and secretary of the B.E.D.A., at the opening of the second day of the conference.

Introducing a discussion on "Lighting for Greater Productivity," Mr. W. Robinson, B.Sc., said that the artificial lighting of factories represented an extremely important part of electricity's contribution to the problem of increasing national productivity.

On the subject of materials handling, Mr. L. Landon Goodman, B.Sc., A.M.I.Mech.E., A.M.I.E.E., said that the problem was one to which very little attention had ever been paid. Comparing the cost of human energy with horse and electrical power, Mr. Goodman said that, allowing for a wage of £8 for a 40 hour week, the cost of one horsepower hour of human energy was 40s.; the cost of one horsepower hour of animal energy in London was 2s. 6d., while the cost of one horsepower hour of electrical energy was 1d.

In summing up the work of the conference, Mr. J. I. Bernard, B.Sc., M.I.E.E., said that much attention had been paid to the comparison between the amount of electricity used by American and British working men. For the Americans, productivity was a sort of national sport in which everybody was interested; something of that spirit was needed in Britain in order to effect a general increase in prosperity.

Oil and Fat Extraction in the Cold

A revolutionary process for the extraction of oils and fats from naturally occurring cellular material has been evolved and was recently demonstrated in London.

THE extraction, recovery, and preparation of a large number of oil and fat bearing materials of animal, marine, and vegetable origin are well known as industrial operations of major importance. The fundamental object of extraction is the rupture of the cell walls in which the fats are confined, and their removal with maximum yield and minimum degradation in quality from the raw material. From the earliest days, animal fats in particular have been extracted by cooking in water, either in open pans or under pressure in retorts, by roasting as in the dry rendering process, or by the use of hot solvents.

Among the disadvantages of the use of heat in fat rendering, are the darkening of colour, production of odour, and contamination with degradation products, the elimination of which has occupied the attention of many generations of oil technologists.

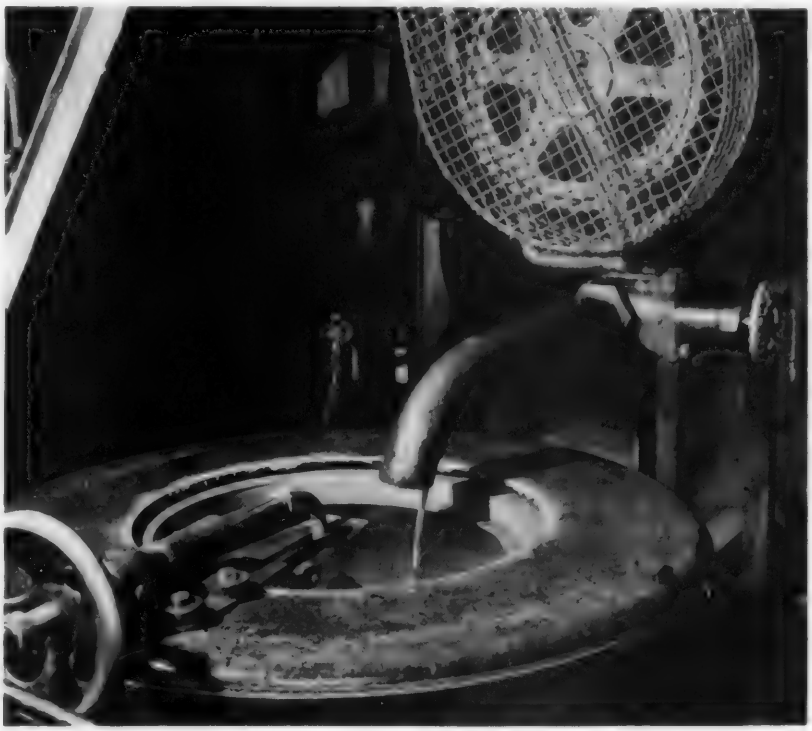
The research and development teams of British Glues and Chemicals have devised and developed a rendering process which is entirely independent of heat, and uses only cold water and mechanical energy to rupture the fat cells and remove their contents.

Raw bones at the top of a conveyor belt, before arriving at the impulse renderer.

This process, which bears the name of Mr. I. H. Chayen, technical director and assistant managing director of the company, is based on the new principle of "impulse rendering." This consists of passing the material to be rendered, suspended in a continuous stream of water, through a vessel in which the water is subjected to a series of high speed and high frequency mechanical impulses. Under these conditions, water acts on the cell walls like a battery of hydraulic drills by which they are instantaneously torn open and their contents washed away.

The company are already operating this process at three of their British plants and also in Toronto; its use results in the production of animal fats of a significantly higher quality than hitherto achieved from these materials. The output from these factories, which is taking the place of imported high quality fats in a number of industries, has reached such proportions that it has been necessary to establish new and improved quality standards to classify the range of fats now in production.

The new process has been used in the first instance for the extraction of fat from bones. This has been carried out on an industrial



Three minutes after bone is loaded into the plant, liquid fat is running off.

The bones have passed through the impulse renderer. In less than a second the fat comes out, floating on top of the water, the degreased bone falling to the bottom.

scale, the present equipment being capable of treating daily an average of 35 tons of bones. The degreased bone is left as a raw material for glue manufacture.

Method of Treatment

The first operation consists of the crushing of the bones. From the crusher, the bones are conveyed by belt to the impulse renderer, and fed through it in a continuous stream of cold water at the rate of two tons per hour. Three minutes after the bones have been loaded into the plant, the fat emerges as a pale liquid which sets to a bland white solid of high purity. The fat and degreased bone are then separated by gravity and are conveyed by different routes through a series of washing and separating processes.

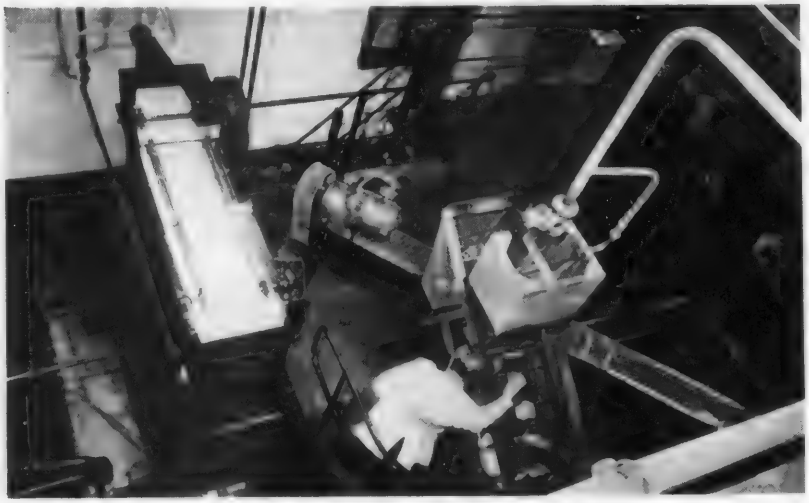
The amazing implications of the process are demonstrated by the fact that three minutes after the bone is loaded into the plant, the fat goes into storage ready for despatch; the degreased bone is ready for glue making, or drying for despatch, within eight minutes of the start of operations, which are all continuous and automatically controlled.

Advantages of Continuous Process

The advantages of a continuous process taking a few minutes against batch operations taking many hours during the heat rendering processes in general use are many and important. Fuel costs are cut very appreciably, as also are plant area and capital costs. The compact and efficient layout is probably one which can best be appreciated by those familiar with such matters. While not being crowded, different items of equipment occupy every inch of available space, without prejudice to their availability, ease of handling, and maintenance.

The foregoing briefly describes the application of impulse rendering to the manufacture of industrial and edible fats from bone and other raw materials. British Glues'

Floating fat and water on their way to the collection tank.



On the left is a fat collection tank. On the right, degreased bone is being wormed upwards for washing and subsequent drying.

team, with the establishment of their latest plant in London, have merely completed the first phase, and there is no doubt that the principle of impulse rendering can be applied to the whole range of fat and oil bearing materials all over the world, with similar striking results.

Other Applications of the Process

At the recent demonstration was shown, on a pilot plant scale, some of the possible applications of this process. The first one is concerned with the fish liver oil industry, where the cold extraction of valuable edible oils with high vitamin content may have a far-reaching effect on future developments. Coincident with the work being carried out in this connexion is that on the treatment of herrings to produce high quality oil and palatable, odourless fish meal of low oil content, which have long been sought by the fishing industry.

It has also been established that the principle is applicable to the vegetable seed and nut industries. Those who attended the demonstration saw pieces of copra about 1 in. square being placed in the experimental impulse renderer and in the matter of minutes a stream of oil issued from the exit. A large number of these products awaits testing, but the principle is so new, the field so vast and varied, and the number of workers trained in this technique so necessarily limited, that it is impossible to predict the rapidity and direction of the next developments. What is clear is that a new and potent force has been introduced into this field.

The Chayen process is entirely British in its inception and development and may well become a dollar earner of some significance. British Glues have entered into an agreement with the Sharples Corporation, one of the leaders in the U.S. engineering industry, who have already been granted the agency for North America. Technical staff of the Sharples organisation have been trained in England and are now setting up demonstration plants in the United States of America.

World Fruit Trade

INTERNATIONAL trade in fresh fruit showed a further marked expansion in 1951, when total exports of the main kinds were only slightly below the pre-war average. The recovery was made possible by the higher level of world production and by the trade liberalisation policies put into effect by Western European countries. Statistics of production and trade published by the Commonwealth Economic Committee, in a new issue of its Commodity Series,* show that the world output of citrus and deciduous fruit in 1951 was 20 per cent. greater than in the period 1934-38; this expansion has been mainly in citrus fruit, especially oranges, but there has also been a substantial increase in the output of table varieties of apples, pears, and peaches.

The output of deciduous and citrus fruit in the principal producing countries during 1949-51 totalled, on average, more than 33 million tons a year, as against 29 million tons in 1944-48 and 26 million tons in 1934-38; compared with the pre-war position, output of deciduous fruit has risen by 20 per cent., and that of citrus fruit by as much as 40 per cent., the increase being largely accounted for by apples and oranges, respectively.

Grapes remain by far the largest individual fruit crop, with an average total production in the principal countries of about 30 million tons, although less than two million tons are consumed fresh. So far as international trade is concerned, the principal banana producers are now the Honduras Republic, Ecuador, and Costa Rica; efforts to restore production in Jamaica, much reduced by the war and disease, continue to be hampered by hurricanes. Except in the Far East, pineapple production is now well above the pre-war level; steady progress is being made in the restoration of the Malayan industry, and considerable development is taking place in South Africa, which became in 1951 the largest Commonwealth producer.

Total exports of citrus fruit by the principal countries concerned amounted to nearly 2·2 million tons in 1951 compared with the pre-war average of a little over 1·9 million tons, the increase being almost entirely attributable to oranges.

Output of canned fruit in the United States, including the Hawaiian pineapple pack, was at a near-record level in 1951, amounting to over 1·5 million tons, and accounted for about 80 per cent. of world output. Canned fruit production in the Commonwealth reached 290,000 tons, compared with 200,000 tons in 1938. The Australian, Canadian, and South African packs each established new records, the most notable expansion being in the Union, where the chief packs are peaches and grapes. Canned pineapple output in Malaya, although recovering steadily, is still well below the pre-war level. Elsewhere in the Commonwealth the canning industry is being developed, notably in the British West Indies and Fiji.

There has been some decline in United States canned fruit exports since 1947 owing to currency difficulties, but the reduction has been more than offset by increased shipments from Australia, South Africa, and some of the canned pineapple exporting countries. In addition, there has been a considerable increase in consignments to the United Kingdom from the Netherlands, Italy, and other European countries.

Estimates for the principal producing countries indicate a raisin and currant production in 1951 of about 480,000 tons, a slight increase over the 1950 figure; in the former case production is at about the pre-war level, but for currants, notwithstanding some recovery in Greece, output is still only about 60 per cent. of pre-war. The output of dried prunes and figs was higher in 1951, but production of other dried tree fruits continued to show a downward trend.

* *Fruit.* Pp. 144+xvi. H.M.S.O. Price 5s. net.

In the United States, by far the largest producer of raisins and the different tree fruits, except figs, production has fluctuated, 1951 being in most cases a good year; in general, however, production is now smaller than in the war years. Australia, the leading Commonwealth producer, has experienced poor crops in recent years, the average pack of raisins and currants in 1949-51 being 20 per cent. below pre-war. United States exports, although assisted by subsidy, have declined since 1948, while Australian exports of dried vine fruit in 1951 were the lowest for many years.

United Kingdom imports of raisins and currants amounted to only 70,000 tons in 1951 compared with an annual average of nearly 130,000 tons for 1934-38. As before the war, consignments to Commonwealth countries accounted for well over half the world trade in raisins and currants.

Wine production has very nearly recovered from the drastic reduction experienced during the war. Output in France and Italy was very heavy in both 1950 and 1951, totalling over 2,000 million gallons, about half the world output; although progress has been made in the wine industries in South Africa, Australia, and Canada, the present Commonwealth output remains relatively small, at about 100 million gallons.

Our Contemporaries

Articles published in the associated journals of the Leonard Hill Group this month include the following:

"Modern Industrial Centrifuges," by E. Ruegg (*Chemical and Process Engineering*).

"Bananas and Manila Hemp," by N. W. Simmonds; "An Electric Eye for Grading Seed," by R. H. Gunson (*World Crops*).

"Anti-Convulsant Drugs, Part III, New Products" (*Manufacturing Chemist*).

"A New Building for the Roumanian Polygra Combine"; "Hungary's New Sports Stadium" (*Building Digest*).

Speeding up the Meat Curing Process

A NEW process by which the curing of meat cuts is accomplished during the smoking stage has been announced from New Jersey.

Designed to embody recently developed techniques applicable to the scientific curing of smoked meats, the new curing material is said to be composed of standard ingredients and sundry common hydrolysates of vegetable protein which were chosen for their effectiveness in stimulating desirable curing reactions.

It is claimed that chilled hams and shoulders, artery-pumped with the cure, can be placed directly in the smokehouse after a momentary immersion in curing brine, colour development and fixation being accomplished simultaneously with the smoking procedures.

Bellies infused with this curing brine are ready for smoking immediately after injection and produce finished bacon within 12 hours calculated from the time of infusion.

In those cases where processors wish to dry-cure bacon, bellies may be rubbed with the new cure without infusion or puncturing. Bacon so treated can be cured and ready for smoking in 48 hours after rubbing and holding on racks at a curing temperature of approximately 40°F.

A new injection unit, designed for use with this cure, has a normal output of more than 300 bellies per hour and requires only one operator. Sixty-six closely spaced needles project upward through the bottom of a four-sided tray, above which is suspended a perforated plate with holes positioned over each needle. A hinged and balanced cover plate is movable up and down by manual actuation of its handle.

The belly is placed skin side up on the perforated plate and the operator then pulls the handle down, forcing the cover on to the meat and depressing the plate so that the injection needles pierce the belly. A stopping device prevents the needles from going completely through the product. When the cover is released the flow of brine stops, springs raising the plate and meat off the needles.

Dietetics in Amsterdam

THAT there was a need for close integration between problems of fundamental nutrition and practical dietetics was amply demonstrated at the First International Congress of Dietetics held at Amsterdam in July last.

For those of the 600 delegates concerned with therapeutic dietetics, the joint meeting with the Congress of the International Diabetes Federation was of particular interest. Papers on the cholesterol problem and on dietary aspects of the disease were read in which recent experiments on serum cholesterol levels were described.

The three morning sessions were devoted to subjects dealing with the nutritional significance of the gut flora, nitrogen balance, hunger oedema, the role of choline in the prevention and cure of fatty livers, the antagonism of wheat and rye protein in coeliac disease, and its bearing on fat adsorption.

Seventeen countries presented papers during the four afternoon sessions, which were devoted to the study of the profession of dietetics and which provided ample opportunity for discussion. It was evident that the training of dietitians, their responsibilities, and the scope of their work varied widely in the different countries represented, thus indicating that the time was not yet ripe for the formation of any kind of international dietetic organisation. Nevertheless, as a result of the Amsterdam meeting, an interim committee, composed of the Associations of Great Britain, Italy, the Netherlands, Sweden, and America, has been formed with the object of maintaining contact between the organisations of different countries and of arranging for a second international congress to be held in about four years' time.

Unusual Sources of Food

In facing the problem of feeding the world's rapidly increasing population, consideration must be given not only to well-known staple products, but also to less familiar foods which are used to satisfy the hunger of at least some sections of the human race. Thus insects figure largely in the diets of some African tribes. Fungi are consumed in much greater quantities on the Continent than in Britain. Commonplace materials, such as seaweed, provide useful food constituents after processing. At a recent conference of the Nutrition Society, the discussion ranged over a wide variety of unusual or novel foods.

A VISIT to Northern Canada and Greenland to investigate the state of nutrition of the natives was described by Dr. H. M. Sinclair. The Esquimaux subsist mainly upon seals, which are their sole source of food during the winter months. The mode of catching the seal depends upon the season. In winter the breathing holes which the seals have made in the ice are sought out with the aid of dogs. The Esquimau then waits patiently until the sound or sight of the seal's breath give him his cue to thrust a spear down the hole. In summer the seals, and the much larger walrus, are hunted from the kayaks among the pack ice. The reindeer and musk ox provide a change of diet.

The Esquimau eats his flesh raw, and in prodigious quantities when it is plentiful. Seven or eight pounds of seal flesh is not considered to be an excessive meal for a growing boy. His only foodstuffs from foreign sources are a little flour and sugar, which do not prevent him from remaining in the rude state of health which is necessary for survival in the Arctic. The Indians inhabiting the forests which fringe the coast of Northern Canada, however, have come to depend very largely on food and liquor supplied by trading posts. For this indiscretion they are paying heavy penalties in the form of rotting teeth and tuberculosis.

Australian Aborigines

Dr. G. H. Bourne explained that the primitive inhabitants of Australia are nomadic, and that they act on the principle of despoiling each area of its readily available supplies of food before moving on to another. Men hunt the kangaroo and wallaby, but women undertake the capture of insects and small porcupines. A strict etiquette has been evolved concerning the division of the prey, and a married man is expected to present considerable portions, which vary for each species of animal, to his wife's parents. The meat is quickly roasted over an open fire.

With the advent of the white man, the Australian aborigine has followed the redskin in changing his dietary habits. Many now have given up their nomadic habits, and subsist as well as they can on flour supplied by Mission stations.

The Niger Delta

The mode of life and dietary habits of the Isoko, a small tribe occupying the rain forest and fresh water swamps near the mouth of the Niger river, were outlined by Dr. B. M. Nicol. The cultivation of yam, cassava, cocoyam, and plantains places this tribe a step above the Australian aborigines in the ladder of civilisation. Fish is caught in the rainy season, and is also obtained from tribesmen on the coast by barter for root crops. Small numbers of pigs, goats, and sheep are kept in the villages, but are killed only for weddings, funerals, and other important occasions. Mutura cattle run wild in the bush, but can be slain only on instructions of the local chief. Chickens are reared mainly for sacrifice to "jujus."

Flying foxes, fruit-eating members of the bat family, are relished by the aborigines.

A member of the Isoko tribe.

The main enemies of the Isoko are malaria, leprosy, parasitic worms, crocodiles, and the bush cow. Under British administration medicine and firearms have given some protection against these perils, and as a result the Isoko are increasing in numbers. With no corresponding increase in food supplies their future sustenance presents the same problem of overpopulation as is confronting India and other Oriental countries.

The knowledge of how the Isoko have survived up to the present

may give some indication of the methods to be adopted if they are to avert privation in the future. A dietary survey by Dr. Nicol indicated that the main part of the diet consisted of starchy roots, which together with small amounts of cereals, legumes, green leaves, and fruit, contributed only about 26 g. of vegetable protein daily. The intake of animal protein was about 20 g., with 12 g. of fish as the main component. One popular method of fishing is based on disturbing the crocodiles, which in turn scare the fish into specially constructed enclosures. Vegetable fish poisons are also used.

The Isoko would go very hungry, however, if they did not resort to a miscellany of other unusual foods. After fish the next most important contribution is made by monkeys, which are shot with dangerous muzzle loading shot guns. Boys catch pangolins and porcupines by snaring, and the giant Gambian rat and cane rats are shot by highly organised parties, with the children acting as beaters.

Other highly esteemed items are goats, giant snails, dried frogs, palm weevils, snakes of various species, and the monitor lizard. Copious draughts of palm wine are used to wash down these delicacies, and to make the Isoko forget the troubles and anxiety of life in an out-of-the-way part of the world.

Insects as Food

An interesting account of insect eating was given by Dr. W. S. Bristowe. His own first venture had been to devour a small spider for the amusement of his friends. Before doing so he had gained confidence from the medical prescription of the same insect by an 18th century doctor for the treatment of malaria. Later he had consumed insects on a larger scale in Siam, after encouragement from His Serene Highness Prince Sithiporn. This august personage had mentioned that his cousin, King Rama VI, had been very partial to the larva of the Cossid coffee-boring moth, particularly when roasted and eaten with rice and salt. He contrasted the idea of

Left: **"Oryctes rhinoceros" whose fat white larvae are roasted.** *Right:* **"Lethocerus indicus" with a flavour of Gorgonzola.**

consuming this clean feeding caterpillar with the depraved European habit of eating such scavengers as lobsters and shrimps. He expressed disgust at our enjoying high game and decaying cheese.

Recognising the force of these arguments, and not desiring to submit to the dictate of irrational taboos, Dr. Bristowe was sufficiently courageous to taste toasted locusts. He found their flavour neither strong nor unpleasant, but difficult to describe. Boiled cicadas were tried next, and were found to have a vegetable rather than an animal taste. They were caught at night in a forest clearing, after lighting a fire and boiling a pot, by the simple expedient of banging pieces of bamboo together. Vibrations resembling the male's love call were set up, which lured the unsuspecting females to their doom.

Other insects used as food in Siam include bees and their grubs, wasp grubs, ants with their larvae and pupae, and flying termites. The giant water bug *Lethocerus indicus*, which is about 3 inches in length, has a strong flavour, rather resembling gorgonzola cheese. It is greatly appreciated

"Melopoeus albostriatus" Sim. Eaten in Siam.

and is correspondingly expensive in the market place. Beetles and their grubs, which are roasted after soaking in coconut oil, also find favour. Two enormous spiders are also used as special delicacies. One, *Nephila maculata*, is often eaten raw, and has a taste suggestive of raw cabbage. The other, *Melopoeus albostriatus*, is 2½ inches long, and after roasting tastes like the marrow of chicken bones.

In Japanese Prison Camps

Dr. S. G. Willimott spoke of his experience of unusual foods in internment camps. Grass snakes had been eaten both by prisoners and by Japanese troops. After toasting over a fire they had a pleasant taste recalling eels. In their extreme hunger some prisoners had eaten clay, and it is perhaps significant that this habit is also known among pregnant Malayan women, who possibly avert anaemia by obtaining iron in this way. In Japan, black beetles are sometimes eaten by women in the belief that they are good for the complexion.

Sprouted cereals and legumes, which can be counted as unusual foodstuffs in this country, except as a basis for making beer and other alcoholic drinks, are used as staple foods in many Oriental countries. The soya bean, which is much favoured for this purpose, gives very tasty products. The increase in vitamin C during sprouting is important from the nutritional standpoint, and provides a further reason for exploring the possibility of using sprouted foods to a greater extent in this country.

Food in Central America

An account of the laborious investigations undertaken by Prof. Robert Harris and his colleagues at the Massachusetts Institute of Technology, on the composition of indigenous foods in Mexico and Central America was given by Dr. Francis Aylward. Maize and the potato originated in this region, which is remarkable for the wide variety of its edible vegetables. Thus Harris collected, classified, and examined over 1,500 speci-

mens from about 250 varieties of plants.

Two common articles of diet, which would seem unusual if encountered in Britain, are the food *tortilla* and the beverage *pulque*. The *tortilla* appears to take the place of bread, and is obtained from maize by first boiling it with lime, followed by washing, grinding, and baking on a hot stone or iron griddle into a flat cake. The use of lime makes the final product rich in calcium, thus achieving by accident the same fortification as is effected in our national flour by adding chalk.

Pulque is obtained by the fermentation of the juice which collects in the central hollow chamber of a cactus plant after the removal of the blooms. It contains about 4 per cent. of alcohol and resembles sour milk in taste. It is not only intoxicating but also highly nutritious, and its use in liberal amounts probably accounts for the excellent nutritional status of the impoverished Otomi Indians, who live at an altitude of 6,500 feet in the Mezquital Valley of Mexico.

Mushrooms and Toadstools

Dr. J. Ramsbottom pointed out that in Britain the attitude towards the eating of fungi is somewhat illogical. Cultivated mushrooms are so highly appreciated that their price during the second world war reached 16s. per pound. On the other hand, fungi growing under natural conditions are regarded with suspicion, and no use is made of the numerous edible varieties, other than the mushroom, which can be gathered in our woods and fields. In this respect, the British show less enterprise than their neighbours in other European countries, where several different types of fungi are usually available from the market stalls.

This reluctance to follow the continental example is probably related to the comparatively small area of our forests, which are capable of providing only small supplies of fungi. There is little opportunity, therefore, for gaining the necessary practice in discriminating between edible and poisonous varieties. Moreover, even if books have been read describing the edible types, there is still some apprehension that identification may be mistaken. It is not worth while to run the risk of an unpleasant death merely for the satisfaction of having a tasty meal.

Dr. Ramsbottom emphasised, however, that only a few fungi are poisonous. Practically all deaths are caused by the common white Death Cap toadstool, *Amanita phalloides*, or by the rarer related species *Amanita verna* and *Amanita viroso*. The three poisons that have been isolated, two being polypeptides and the other a glucoside, have been found to be relatively slow but deadly in their action. The effect of an injection of an extract of *amanita* in causing nervous excitation and muscular spasms in a mouse was shown in a film, which also indicated how the variety could be recognised by its white gills and a white mantle growing round its base. Familiar so-called tests for distinguishing between poisonous and non-poisonous fungi, depending on the ease of peeling, turning silver black, and the emission of coloured juices, were condemned as valueless.

Less dangerous poisons are contained in the fly agaric, *Amanita muscaria*, which has a bright red cap. Its main toxin is mycetoatropine, which causes cerebral excitement. Atropine is present in a few species in sufficient amounts to cause sweating, while others are merely highly indigestible. When the question of individual allergy is left out, however, there are only about a dozen among the numerous toadstools which can be considered in any way harmful after cooking.

Fungi as Staple Foods

A few instances were quoted of the use of fungi as major components of the diet. Darwin found that the natives of Tierra del Fuego ate the fungus *Cyttaria Darwinii*, which grew in vast quantities on *Nothofagus*, as almost their sole vegetable food. In New Guinea, there is a small cave-inhabiting tribe whose food consists mainly of fungus and palm shoots. In the 18th century it is recorded that the people in districts surrounding Nuremberg were reduced to subsisting on fungi and black bread, which sufficed to keep them in good health. Fungi were also largely used as a substitute for meat in the fasts ordained by the Russian Church. During the first world war they served as a form of manna to German forces who were kept constantly on the run in the East Africa campaign.

Opinions on the nutritive value of fungi have been divided. Some authorities consider them to be equal to beef, others condemn them as practically worthless. The content of nitrogenous materials is quite high, but it is still uncertain how much of the nitrogen is combined in the form of protein. Widely divergent amounts of ascorbic acid and of the various B vitamins have been reported to be present in different varieties.

Food from Seaweeds

The greatest potential source of food to be covered by the programme of the conference was discussed in an interesting paper by Dr. W. A. P. Black, of the Institute of Seaweed Research. In Britain, as in other western countries, seaweed may be counted as an unusual form of food, with dishes such as *sloke* and *laverbread* surviving as a memorial to earlier times in outlying districts near our coast.

The position is quite different, however, in some Oriental countries, where enormous amounts of seaweed are consumed. In Japan, no less than a quarter of the daily diet is said to be derived from this source. Thus brown seaweed is incorporated in the flour, and used as noodles, which are toasted and served with rice or in soup. Species rich in mannitol and glutamic acids, such as *L. japanica* and *L. angustata*, are used for sweetening and flavouring.

Dr. Black explained that seaweeds may be divided up into brown, red, green, and blue-green varieties, which show fundamental differences in their chemical composition. Around the coast of Britain the brown weeds predominate, with the possibility of

a crop of about 180,000 tons between high and low water marks, and probably about 10 million tons in deeper water. The most common weed below the low tide line is *Laminaria cloustoni*. Research has shown that the carbohydrate content of its frond, or leaf, varies greatly according to season, but that the composition of the stipe, or stalk, is little changed.

Brown Seaweeds

The primary product of photosynthesis in the brown algae is presumably the hexahydric sugar alcohol mannitol, which makes up from 5 to 37 per cent. of the dry matter according to species, habitat, the season of the year, and the depth of immersion. Mannitol is sweet, and mildly laxative in doses of 1 to 2 oz. It is at present employed as an edible dusting powder and anticaking agent, and may find further application as a sweetening agent for diabetic foods.

In the place of the starch of land plants, the brown algae contain the polysaccharide *laminarin*, which is made up of about 20 glucose units. It is present in up to 36 per cent. of the dry weight, and may be completely assimilated by cattle and pigs. Another polysaccharide component, present in the cell walls, is alginic acid, which is made of β-D-mannopyruronic acid units linked in a straight chain through the 1 and 4 positions. This important substance is highly efficient as an emulsifier and stabiliser, and it has been used extensively in these roles in food manufacture. It is well tolerated by the human, and mildly laxative.

Brown seaweeds also contain proteins which appear to resemble those of land plants in composition. Fat usually makes up only 1 per cent. of the dry weight, but reaches 8 per cent. in the exposed weed *Pelvetia canaliculata*. Minerals are high, as in all forms of seaweed, with ash contributing 10 to 50 per cent. of the dry matter, and iodine 0·03 to 1·5 per cent. on the same basis. Vitamin A activity is conferred by carotene and other provitamins, and vitamin C and

Bleached carrageen in its raw state.

members of the vitamin B complex are present in substantial amounts. Recently a surprising claim has been made, on the basis of microbiological tests, that brown algae are comparable with liver as a source of the anti-anaemic vitamin B_{12}.

Red Seaweeds

The red seaweeds differ in their biochemistry from the brown weeds in having dulcitol or sorbitol as their primary sugar alcohols instead of mannitol. A galactan ethereal sulphate is also present in most red species. Although in Britain only small amounts of red algae are found, they have been the only varieties to be used as human food. The *laver* or *sloke*, which has already been mentioned, is made from *porphyra lacinata* by cooking and flavouring with vinegar and pepper. Two other red seaweeds, *Chondrus crispus* and *Gigartina stellata*, are both known as carrageen or Irish Moss, and are extracted to obtain a polysaccharide carrageenin which is used for making jellies.

Agar, another gelatinising polysaccharide, is obtained from red algae indigenous in the East Indies and consumed in large quantities in China and Japan, often as a substitute for the expensive "birds' nests." Imports into western countries are used for making jellies for human nutrition and media for bacteriological work. Both agar and carrageenin are very poorly digested by man, and have been used for this reason as a form of roughage in certain bakery products.

Future Developments

In dealing with problems of practical nutrition in different parts of the world, ranging from the Arctic to the tropics, the papers given at the conference emphasised the wide diversity of the ways in which the human appetite may be satisfied. The Japanese eating his seaweed, the Esquimau devouring his seal flesh, and the Mexican washing down his *tortilla* with *pulque*, all contrive to keep in reasonable health. How would their health react if their diets were suddenly to be interchanged? Research has shown that when cows are given seaweed they are at first unable to digest it, but that they acquire the ability within a few days. Probably the human, although permanently incapable of following the cow in digesting cellulose, is nevertheless able to educate his intestines in due time to cope with widely different types of diet.

Future developments may perhaps be expected in the greater use of fungi as flavouring agents, and of seaweeds both as animal fodder and as agents used in food manufacture. Brown seaweed may be readily silaged, and its value in feeding cattle is already under investigation.

Algae in the Diet

Experiments have also been in progress in Germany and elsewhere on the possibility of growing green algae under strong illumination and with supplies of carbon dioxide which ensure rapid growth. By carefully regulating the experimental conditions it has already been found possible to produce algae rich in protein or in fat as desired. By capturing the energy from intense tropical sunlight with cultures of suitable algae it may eventually be possible to make a substantial contribution towards the feeding of future generations.

British Cake and Biscuit Industry

That complete freedom from controls in both the flour confectionery and biscuit industries would assist manufacturers to improve production is one of the points stressed in the report of the Executive Committee of the British Cake and Biscuit Association for the year ended May 31, 1952, of which this is an extract. The Committee feels that at this time of acute national and financial crisis, instead of increasing controls, the Minister of Food should consider the alternative solution of complete freedom.

OVERSHADOWING all issues in a year of strenuous work on behalf of the cake and biscuit industries by the British Cake and Biscuit Association came, in November, 1951, the solvency crisis. Grievous cuts in rationed and unrationed ingredients were the immediate effect. Dismissal of trained and valued hands followed, a situation that could have been much worse, had it not been for the foresight of manufacturers in building up and maintaining reserve ingredient stocks.

The rapid development of a free commodity market in unrationed materials, combined with increases in rationed ingredients, had lulled the two industries into a state of confidence in the future, and a pre-war economy of competitive conditions was commencing when there was a complete reversal of the Government policy towards industry, and the uncertainties of Government control were again accentuated.

Unrationed commodities were cut by 75 per cent.; rationed commodities were reduced to a level lower than the worst of the war years, and the industries were faced with a period of gravely reduced production, the result of which must be to the public disadvantage.

The Executive Committee registered with the Director of Bakery the strongest possible protest against the action of the Ministry of Food in reducing the sugar allocation to the cake manufacturer. It pointed out that surpluses of sugar existed, that sugar was such a cheap and necessary food that it should rank pre-eminent in the purchasing programme of the Ministry. Processed sugar, *i.e.* fondant, etc., while freely available (at that time), was very costly, and the Committee felt that to buy processed sweetened materials at a high price, instead of buying raw sugar at less than half the price, was an indefensible policy.

Flour Confectionery

In February, 1952, flour confectionery was freed from price control, and as past records show, the Committee has worked energetically towards this end. There is so far no evidence that freedom from price control has resulted in any general increase in prices.

Prior to this revocation, the Committee was instrumental in obtaining an amendment to the Flour Confectionery (Control and Maximum Prices) Order, 1951, whereby cake manufacturers were permitted to charge for the cost of containers for Christmas cakes.

In view of the severe cuts in ingredients sustained by the cake industry, the Committee has been concerned over the continued importation of considerable quantities of fruit cake from abroad. The Committee considers it to be a wholly wrong policy that the Board of Trade should continue to permit the expenditure of sterling on manufactured cake, when the same amount of money, if expended on raw materials, would help to continue to maintain employment in the British cake industry as well as maintaining prices at the lowest possible level by keeping overhead costs down to a minimum point. Representations to this effect have been made to the Parliamentary Secretary of the Board of Trade.

Representations have also been made to the Ministry of Food through the Alliance Council that the ban against the packing of cakes in tinplate containers be lifted in order to permit packing of cakes in fancy tin boxes for the Coronation period.

Biscuits

At the request of the Committee, the Alliance Council agreed to the regular publication of a Schedule of Biscuit Manufacturers, showing names and prices of approved new lines, and increases in prices obtained for established lines. The difficult problem of the costing of assortments has also been under review, but the continued ban by the Ministry of Food on the assortment of biscuits has prevented the simplified system of costing proposed by the Committee from being tested in practice. It seems incongruous that at the present time assortments of plain or unsweetened biscuits are permitted, while assortments of sweetened biscuits are not allowed.

The Committee has supported every effort of the Alliance Council to obtain freedom in the use of small tins for the biscuit industry. This now becomes of particular importance in view of the Coronation year ahead.

Plain unsweetened biscuits have now been removed from price control, and, as in the case of flour confectionery, there is no evidence of any consequent increase in price. In view of the experience of these two outstanding examples, there seem to be no sound reasons why the Ministry of Food should continue to insist upon the rigid price control on sweet biscuits.

Christmas Puddings

Considerable difficulty is being experienced by Christmas pudding manufacturers in satisfying the requirements of the Prepacked Foods (Weights and Measures: Marking) Order, 1950 (No. 1125).

Difficulties are caused by evaporation during storage after the puddings have left the manufacturers' premises. Circum-

stances cause the feeling that there is a very strong case for seeking some modification of the law so far as it concerns the control of the net contents of Christmas puddings.

The Committee is supporting Dr. Ian Wilkinson's view that obviously the aim of the authorities, in including puddings in the Prepacked Foods Order, is to protect the consumer. With this in mind, it is reasonable to suggest that the real value of the article is in its dry ingredients, and that any water lost by evaporation during the storage is, in any case, regained in its subsequent preparation for the table.

Secondly, it is recommended that the statement of net weight should remain as at present, but that the legal requirements should be based on the dry solid content, and that the dry solid content of a 1 lb. pudding should not be less than 12 oz. Such a requirement is easily checked by analysis, and is a factor not affected by storage conditions.

It is a precise figure to which manufacturers work with a maximum degree of efficiency, and, from the point of view of the authorities, provides legislation which could be administered with the minimum of dispute.

The Committee is seeking the agreement of the Food Manufacturers' Federation to the foregoing proposal.

Artificial and Synthetic Cream

A report issued by the Ministry of Food on artificial and synthetic cream is of great importance to flour confectionery manufacturers. The two issues upon which the Committee took the opportunity of consulting with, among others, the British Baking Industries Research Association were (*a*) the desirability or otherwise of proposed standards for artificial cream, and (*b*) the finding of some better name for artificial or synthetic cream used by the confectioner.

The suggestion that has been put forward is that the synthetic cream produced for or by the manufacturer for use in flour confectionery should be known as "confectioner's cream," and that certain minimum standards should be applied to this product.

For the time being, any change in the name of synthetic cream will, when in force, be likely to apply only to the product as it is delivered by the manufacturer. There is, so far, no discussion on the subject of how the flour confectioner shall name the products containing synthetic cream.

The Datum Principle

It was in 1947 that the Association first heard of the Ministry's desire to replace the existing datum system of allocating ingredients by some more up-to-date method. On that occasion, the Secretary, in company with the late Sir Eric Palmer, lodged a vigorous protest against the proposals.

In July, 1949, the Ministry of Food addressed a letter to the Association, asking that consideration be given to the Minister's desire to replace the datum system in respect of flour confectionery (1) when it reaches 80 per cent. or more of pre-war output; (2) where the supply of the principal ingredients reaches 80 per cent. or more of datum, or (3) where demand is likely to be met at a level lower than 80 per cent.

At the same time, a similar letter was addressed to the biscuit industry. The Association, replying for cake manufacturers, pointed out that the peculiar circumstances, combined with the pride of the manufacturer, necessitate the maintenance of a certain quality in production, and cuts in allocations would be reflected in a reduction of the total volume of production.

There is no evidence to show that the demand for the goods provided by manufacturers is likely to be met at a level lower than 100 per cent., indeed, it was contended that if raw materials were again freed, 100 per cent. pre-war production would not meet the demand. Competition must be on quality plus volume, and cannot be on volume minus quality. To try to enforce a competitive market on products of inferior quality is to create wastefulness. For these reasons, the Committee could suggest no basis alternative to the existing system of allocations.

The biscuit industry, through the Alliance Council, gave a similar reply.

In 1950, when supplies of rationed ingredients still did not permit of public demand for cake and biscuit products being satisfied, there began to appear on the British market imported unrationed ingredients which, at first sight, appeared to be an evasion of our rationing laws, but being free on the market, although high in price, were of use to food manufacturers. The volume of these unrationed ingredients steadily rose, and reached a climax in 1951. There was no clear guidance by the Ministry as to how these unrationed materials were to be regarded by manufacturers. Some manufacturers immediately seized the opportunity of additions to their rationed stocks, but others considered these unrationed materials to be black market, and held off buying.

Cut in Unrationed Ingredients

The volume of output of both cake and biscuit manufacturers steadily rose to high levels, but still the demand was greater than the supply. By the middle of 1951, biscuit and cake manufacturers buying direct or through agents were contracting for vast quantities of sweetened fat, fondant, couverture, mincemeat, and similar products. Then, without warning, the blow fell. At the end of 1951, rationed sugar was cut by 2½ per cent., and rationed fat was cut by 33 per cent. of datum usage. The allocation of rationed fats and oils issued for the manufacture of biscuits was decreased by 31 per cent. Unrationed materials were cut by 75 per cent.

It was at this stage that the Ministry of Food revived the question of an alteration in the datum basis, and insisted that, in considering this alteration, account should be taken of manufacturers' usage of unrationed ingredients; provision should also be made for new entrants to the industry who,

up to this time, had been entirely dependent upon unrationed ingredients. Discussions on the issue commenced in November, 1951. The industries felt very strongly that, while there might be a case for an alteration of the existing datum principle, it was wrong to impose it upon the industries at a time when rationed ingredients were at a level lower than they had been throughout the whole of the war years.

The biscuit industry stated that it was quite prepared to consider a revision of datum, subject to an improvement in the severe cuts in rationed ingredients.

Modifications Rejected

The cake section of the Executive Committee of the Association, feeling that the Minister was serious in his intentions, and that ultimately a plan might be imposed upon the industry which would not be to its liking, decided to investigate the possibilities of preparing a plan for a modification of the datum principle which, while meeting the Minister's wishes, would not seriously harm those manufacturers who had not made use of the unrationed materials which, up to the end of 1951, had been so freely offered on the market.

After several long sessions, a plan was produced which received the approval of the Executive Committee. This plan had three primary principles: (1) that there should be simplicity in operation; (2) that no manufacturer should suffer a reduction of ingredients because of the operation of the scheme; and (3) that provision be made for hardship cases.

The plan was submitted to the Cake Committee of the Alliance, but this Committee refused to accept the principle that a revision in the system of allocations was necessary and, in the absence of unanimity, no further action was taken.

Just before the close of the Association year, Dr. Charles Hill, Parliamentary Secretary to the Ministry of Food, again called representatives of the food industries together and insisted that

(*Continued on page 499*)

One of the wine presses at the "Château du Clos de Vougeot."

International Crop Congress

THE Third International Congress of Crop Protection, held in Paris from September 15 to 21, had, as its President, M. Jean Lefevre, Director of the *Institut National Agronomique*. *Présidents d'Honneur* were M. A. Stassens, organiser of the first Congress held at Louvain in 1946, and Lt.-Col. F. J. Griffin, General Secretary of the Society of Chemical Industry and organiser of the second Congress held in London.

The Congress was divided into eight sections, each of which had a French chairman and secretary; the committee for each section was, however, composed of scientists from foreign countries chosen by the scientific committee of the Congress. The sections included one each on chemical, physical, and biological studies, as well as on the modes of action and toxicity of products for the control of insects, cryptogams and other harmful vegetable organisms, on spraying and dusting equipment, on economic problems, and on legislation concerning the use of toxic products.

The Congress opened with an address by M. Lefevre. Among the lectures delivered before the plenary sessions was one on "The Use of Antibiotics in Crop Protection," by M. Darpoux, one on "Growth Substances in Crop Protection," by Prof. Chouard, of the *Conservatoire National des Arts et des Sciences*, and one by Dr. W. E. Ripper of Pest Control on "Systemic Insecticides."

During and after the meeting, several excursions were made, including one to the *Centre Nationale de Recherches Agronomiques*.

A memorable climax to the Congress was enjoyed by a party of delegates who visited the *Château du Clos de Vougeot*, an ancient monastery with a well-merited reputation in the annals of viticulture which has become the temple of the no less celebrated Brotherhood and which prides itself, with reason, on being a true "League of Nations."

The banquet was a truly magnificent affair, with food "delectable and luscious" and the wines superb. At its close, the quaint and picturesque ceremony of the enthroning of a number of knights took place in the presence of its Grand Master, its Grand Chancellor, its Seneschal Chamberlain, and other notabilities of the Order of the *Chevaliers du Tastevin*, in their robes and square hats. These newly elected persons were selected from those among the participants of the Congress who desired to be admitted to this community of epicures and experts in wine tasting, who count among their members eminent personalities of all nations in the fields of diplomacy, politics, art, science, industry, and commerce.

Applied Bacteriology

The microbiology of foods, the possibility of high frequency sterilisation, and the use of antibiotics were among the items discussed in the symposium held during the Summer Conference of the Society for Applied Bacteriology. Papers read at other sessions covered a wide range of bacteriological subjects of industrial interest.

THE subject of the symposium contributed by H. B. Hawley (Yeovil), M. Ingram (Cambridge), R. S. Hannan (Cambridge), A. Hirsch (Bedford), N. R. Knowles (Belfast), and Miss M. P. Scarr (Bromley) was "Aspects of Food Preservation." Mr. Hawley, introducing the subject, described the origin and some of the earlier methods of food preservation; having outlined the principles required, he gave some of the modern chemical, physical, and biological methods in use.

High Frequency Sterilisation

Dr. Ingram discussed the possibility of sterilisation by high frequency voltage fields using a voltage gradient of 1,000 volts per cm. Heating during treatment is a major problem, and special precautions and apparatus have to be used to keep the test material cool. He described various types of apparatus and pulsation treatments employed experimentally, and said that, when temperature effects were eliminated, there was no evidence of significant lethal action on yeast cells, *Bacterium coli*, or on bacteriophage. Earlier reports on the apparent success of the treatment must be attributed to heating effects.

Dr. Hannan described sterilisation experiments with high energy electrons using an electron accelerator giving $0{\cdot}1$ to 15×10^6 electron volts or using gamma-rays from Co^{60} with energies of $0{\cdot}7$ and $1{\cdot}2 \times 10^6$ electron volts. By irradiation from two sides, the former electrons can penetrate uniformly and effectively up to 10 cm. depth, and the latter rather more deeply. Certain deleterious side effects can be avoided by pre-freezing. Opinions are not in entire agreement on the actual lethal doses for micro-organisms, but in general $0{\cdot}2 \times 10^6$ R will kill vegetable bacterial cells, and $0{\cdot}5$ to 2×10^6 R bacterial spores; bacteriophage is more resistant than bacterial cells or enzymes. The dose required to kill is dependent on a number of factors including the suspension medium and oxygen tension. The system appears to be economically possible and would have wide applications in the pharmaceutical field.

Antibiotics in Food Preservation

In his paper on antibiotics in food preservation, Dr. Hirsch said that, in general, antibiotics have been used experimentally for the preservation of certain non-acid foods, the main organism to be dealt with being *Cl. botulinum*. Subtilin was of some value with canned peas, but in general the method does not appear to be practicable. Nisin has been used in cheese to prevent growth of Clostridium species (mainly *Cl. butyricum*). This antibiotic appears to be more effective in inhibiting germination of spores than development of vegetative cells.

Microbiology of Egg

Describing his observations on the microbiology of raw and heat-treated liquid egg, Mr. Knowles said that fresh laid eggs are practically sterile internally but low grade eggs may contain many millions of bacteria per g. On hard freezing, the viable bacterial population may be reduced by up to 55 per cent. Duck eggs are generally more heavily contaminated, carrying in particular Salmonella bacteria.

By careful organoleptic control, the quality of raw hen eggs used for liquid egg preparation has recently been improved so that bacterial counts have been much reduced, and a suggested standard of less than 5×10^6 viable bacteria per mg. would be meritorious. Heat treatment is carried out at 149°-150°F. for three minutes in a modified plate pasteurising plant. This reduces the bacterial count to below 1,000 per g., but careful control is necessary to reduce coagulation deposits on the plates.

Sugar-preserved Foods

Miss Scarr in her paper on the microbiology of sugar-preserved foods dealt particularly with the properties of osmophilic yeasts and moulds, and discussed the types usually found as contaminants, and also their adaptability. Spoilage occurs through growth of these resistant organisms or from local dilution of syrups brought about by condensation on the surface.

Coli-aerogenes and B. Coli

Papers given at other sessions included three on the detection and classification of organisms of the coli-aerogenes group. The first, by N. P. Burman and C. W. Oliver (London), showed that Folpmer's glutamic acid medium is somewhat superior to MacConkey medium in detecting *Bact. coli* in water; another by T. Richards and M. T. A. Fouad (Reading) discussed the use of inorganic media containing glucose in the classification of the group, and a third by S. B. Thomas and colleagues (N.A.A.S.) reviewed the significance of the coli-aerogenes and *Bact. coli* assessments from over 2,500 samples of farm waters.

Dairy Disinfectants

W. A. Hoy and L. F. L. Clegg (Shinfield) described a new test for dairy disinfectants, using aged milk in soiled churns. Results obtained suggest that they might parallel those from longer-termed field trials. Miss C. Higginbottom and D. W. F. Wheater

(Hannah Dairy Research Institute) discussed the occurrence of *Streptococcus bovis* in rumen contents, showing that there is a significant increase during the first hour after feeding; Mrs. A. C. Stirling (Edinburgh) indicated the importance of lactobacilli in silage to ensure a rapid fall in *p*H value and so reduce nutritional losses.

Other Papers

From the public health aspect, A. Clarenburg (Utrecht) discussed the occurrence of Salmonella bacteria in meat. Outbreaks of poisoning from this source are usually traced to meat products rather than raw meats, and carrier animals increase the complications.

E. B. Reid and M. Woodbine (Aberdeen) demonstrated the Pressfish process for preparing vacuum dehydrated foods and discussed the microbiology concerned, and a paper by S. E. Jacobs and Miss M. J. Thornley (Ambleside) on the effect of ultrasonic waves on bacteria suspended in milk showed that treatment at 20 Kw. or at 1 Mw. was only partially lethal to a variety of bacteria, increased protection apparently being afforded by the high protein content. A. M. Paton and T. Gibson (Edinburgh) described an improved technique for assessing microbiological lipase activity, and Miss J. P. Cowne and J. R. Postgate (Teddington) an improved medium for estimating sulphate-reducing bacteria by dilution counts. The normal medium is supplemented with sodium sulphide and cysteine or ascorbic acid, rendering sulphate-reducers easily detectable by precipitation of black ferrous sulphide.

Pectin Manufacture

A UNIQUE addition* to the literature on pectin has been made by a German chemist with a very wide knowledge of his subject. He has produced a book which tackles the subject in six separate major sections, and in each section, after a general *exposé* of the subject, has given a very comprehensive list of patents from 18 different countries, each being described as to its fundamental new feature, and in the majority of cases an actual example is given in considerable detail. The author is well qualified to do this, as he is closely associated with the German Patent Office.

The introductory sections are well worth reading, although he does not deal with the theoretical side as comprehensively as Kertesz does in his classical treatise. Nevertheless, sufficient information is given to enable readers to link up the introduction with the ensuing patents; it is certainly of very great value, in studying any particular phase of pectin manufacture, to be able to find all the references to the patent literature grouped together under one heading.

The author does not disdain those earlier references which go back 30 or 40 years, and he is sufficiently up to date to have included in his list those which are as recent as the end of 1951. These references, which appear in the body of the text, represent a very remarkable achievement considering that the book itself was available for general sale early in 1952.

There is a splendid set of appendices setting out the patent numbers alongside their references in the book, an author index in alphabetical order to the references which have been cited, and a subject index which appears to be fully comprehensive.

The production of pectin has for many years been regarded as a very difficult project for new firms because of the complexity of the patent literature. This book should very considerably clarify the position and enable those who are thinking along the lines of pectin, its derivatives or its associated enzymes, to review the matter with much greater facility than has previously been possible.—V. L. S. C.

* *Die Pektine*. By Dr. Heinrich Maass. Pp. 415. Dr. Serger and Hempel, Braunschweig. Price DM.20.

Research on Virus Diseases

THE increasing interest in virus diseases brought a hundred members of the East Malling Research Station Association to a recent Members' Day function when Dr. R. V. Harris, head of the Plant Pathology Section, reviewed the history of work on virus diseases at East Malling and referred to the spectacular advances made by Mr. A. F. Posnette during the past two seasons in the realm of tree fruit viruses.

Mr. Posnette described the current work on virus diseases of strawberries, particularly the "degeneration" of those varieties which are "tolerant" to the Yellow-edge and Crinkle groups of viruses, including the now important Climax.

His work on the biology and control of the Strawberry Aphid was described by Dr. G. H. L. Dicker. In experiments correct spraying had reduced the aphids to very small numbers, and a routine spray of Schradan during the second half of April was recommended.

After Mr. Posnette had outlined the recent work on tree fruit viruses, members were shown diseased and healthy trees of a number of cherry and other varieties.

British Cake and Biscuit Industry

(Continued from page 497)

steps should be taken to alter the existing datum principle, such revision, which should be made by various industries in consultation with their respective divisions of the Ministry, to be based upon the ingredient situation existent at the present time.

The Executive Committee took the opportunity at the Llandudno Conference to call members together in order to explain the circumstances which had arisen, and to seek such advice as members had to give.

The Association is actively supporting the efforts of the National Dried Fruit Dealers' Federation to end the control of dried fruit, in order that its purchase and distribution may once again revert to the established peace-time channels of the trade.

News from the Industry

FORTHCOMING EVENTS

The Nutrition Society

The Nutrition Society will hold a whole-day conference, starting at 10.30 a.m., at the Department of Biochemistry, The University, Sheffield 10, on Saturday, December 20, on the subject of "The Role of Vitamins in Metabolic Processes."

The chairman will be Prof. H. A. Krebs, F.R.S., and the following contributions have been arranged.

Prof. C. P. H. Dam: "Recent research in the vitamin K field."

Dr. L. J. Harris: "The mode of action of vitamin C."

Mr. D. E. Hughes: "The metabolism and function of pantothenic acid."

Dr. T. Moore: "The fat-soluble vitamins in metabolic processes."

Dr. J. W. G. Porter: "Present knowledge of the metabolic role of vitamin B_{12} and related compounds."

Dr. H. M. Sinclair: "Nutritional aspects of pyridoxal as a coenzyme."

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The Royal Institute of Chemistry

The following meetings are among those arranged by the Royal Institute of Chemistry for December:

Dec. 3. "Developments in the Chemistry of Free Radicals," by Prof. D. H. Hey, at 7 p.m. at the South-West Essex Technical College, Walthamstow (with the South-West Essex Technical College Chemical Society).

Dec. 11. "Some Recent Developments in Physical Methods of Chemical Analysis," by Dr. J. E. Page, at 7.30 p.m. at the Acton Technical College.

*

Society of Chemical Industry

The December meetings of the Food Group of the Society of Chemical Industry are as follows:

Dec. 5. "The Role of Glycerinated Fats in Baking," by Dr. J. B. M. Coppock and Mr. M. A. Cookson. A joint meeting with the Oils and Fat Group and the Glasgow Section, to be held in Glasgow.

Dec. 10. "Food and the Future. 1. The Problem of Future World Food Supply," by Mr. F. Le Gros Clark and Mr. G. V. Jack. A Nutrition Panel meeting.

The Agriculture Group of the Society have arranged the following meetings for December:

Dec. 15. "Chemical Control of Animal Parasites," by Mr. H. E. Harbour at 5.30 p.m. at the Chemical Society. Crop Protection Panel meeting.

Dec. 16. "The Determination of Phosphorus and Potassium in Acid Extracts of Soils," by Dr. G. W. Cooke, Dr. J. H. Hamence, and Dr. N. H. Pizer, at 2.30 p.m. at the Chemistry Lecture Theatre, Royal College of Science.

The London Section of the Society have arranged one meeting for December as follows:

Dec. 1. "Essential Oils," by G. E. Smith, at 6.30 p.m. at the Chemical Society. A joint meeting with the Fine Chemicals Group and the London and S.E. Counties Section, R.I.C.

The December meeting of the Microbiology Group is as follows:

Dec. 18. "Aspects of Cell Life—Behaviour of Embryonic Cells in Tissue Culture," by Dr. A. Hughes, at 6.15 p.m. at the Institution of Electrical Engineers.

Erections and Extensions

Plans have been drawn up by British Canners to carry out extensions to their canning factory at Bewell Street, Hereford.

Business Efficiency

A new electronic stencil machine, which considerably expands the scope of stencil duplicating, was one of the chief exhibits of Roneo at the Glasgow Business Efficiency Exhibition. Other items displayed included unit desking, visible records, postal franking machines, and cheque signer and signature machines.

Canadian Sales Link

The incorporation of Autopak Ltd. in Canada, linking up a sales and service organisation throughout the Canadian Provinces, has been announced.

These arrangements have been made by the managing director, Mr. Arthur R. Smith, during a six months' business trip throughout Canada and the U.S.A. He would be pleased to advise anyone, with sound established lines, interested in entering this market.

Price Reductions

Price reductions in a wide range of fluorescent fittings and accessories are announced by Philips Electrical. Altogether prices of 30 fluorescent fittings and five tungsten lamp reflectors have been reduced, together with auxiliary gear for 5 ft. 80 watt and 4 ft. 40 watt fluorescent tubes.

The company's starter switch for 30, 40, and 80 watt tubes has also been reduced in price.

*

Reduced prices have been announced by Crompton Parkinson for many of their more popular lighting fittings and also for control gear.

APPOINTMENTS

Mr. J. D. Nuttall, secretary of the Triplex Safety Glass Co., has been appointed to the board of Quickfit and Quartz.

*

The Hon. J. Gordon Macpherson has been appointed a director of Macpherson, Train and Co. He will continue to be director-in-charge of the canned goods, sundry foods, meat, and hardware departments.

He is also a director of the associate companies, Allied Canners, Allied Canners (Boothstown), Allied Canners (Ramsgate), and Icemark.

*

At the annual general meeting of Corbatch Canners, Messrs. R. B. Adamson, W. Butterworth, and T. A. Seaman were elected to the board.

Fluorescent Lighting Fittings

Latest additions to the range of fluorescent fittings available from Crompton Parkinson are the closed top 5 ft. 80 w. one lamp reflector and the slotted top 5 ft. 80 w. one lamp reflector.

Constructed on entirely new lines, the fittings incorporate the most up-to-date ideas of combining plastic and metal to give mechanical protection of electrical parts and wiring.

Plymouth's Food

In his annual report as chief inspector of the City of Plymouth Weights and Measures Department, Mr. H. L. Stevenson states that some 1,852 inspections were made at retail shops and manufacturing establishments, 76,707 articles of food being tested. Faults were found with 2,015 articles, the number found deficient in weight or measure being 1,828, while 187 were incorrectly marked. A total of 20 prosecutions were made during the year, an increase on the previous year's figure, and four other offenders were warned by the department.

Sausage Casings on Show

A synthetic edible sausage casing is to be shown by The Oppenheimer Casing Co. at the Smithfield Show, during which will be demonstrated the filling of this sausage skin.

The Hypak division of this company, which also produces protective and hygienic packaging for all trades, will be displaying many new products including polythene bags for poultry.

Dust-free Sifting

A smaller machine incorporating all the superior features of the Flowmaster plansifter, and known as the Junior sifter, has been designed by Henry Simon to meet the need for a small, flexible, dustproof, and efficient sifting machine for screening and grading powdered or finely granulated materials at economic rates of throughput.

The sieves, of which there are eight, are enclosed in a steel case suspended by canes from a steel frame, and driven through an eccentric mechanism mounted on the frame beneath the case. The sifting covers are attached to wooden frames of uniform size so that they can easily be interchanged, the frames being fitted into drawer-type trays of non-corroding aluminium alloy. The trays are fitted with fabric cleaners which, by reason of their superior efficiency, have entirely superseded brushes. The clothing of the sieves can be of wire, silk, or nylon bolting cloth, according to the type of material being treated.

It is possible to arrange the sieve trays in any one of three different schemes in order to make different separations. The sieves are housed in two sections of four trays each, and one or two inlets and two, three, or four outlets are available, according to the scheme chosen.

The machine, which is 8 ft. 10 in. high and 8 ft. 11 in. long, normally requires a motor of only ¼ h.p.

Carton Users in Conference

Carton users from the Midland area attending the Boxfoldia packaging conference in Birmingham on October 2 heard Dr. G. L. Riddell, F.R.I.C., Director of the Printing, Packaging, and Allied Trades Research Association, speaking about the work of the Association.

The second session dealt with a subject not directly related to packaging, Miss Beryl Foyle, joint managing director, speaking on "Training for Management." Miss Foyle was a member of the Management Education Productivity Team which visited the U.S.A. in 1951.

During the conference, two exhibitions were on show: "Putting It in Print," the travelling exhibition of the British Federation of Master Printers, and the PATRA exhibition, showing visually the type of work carried out by the Association on particular print problems and on research into new developments.

Refrigerated Display

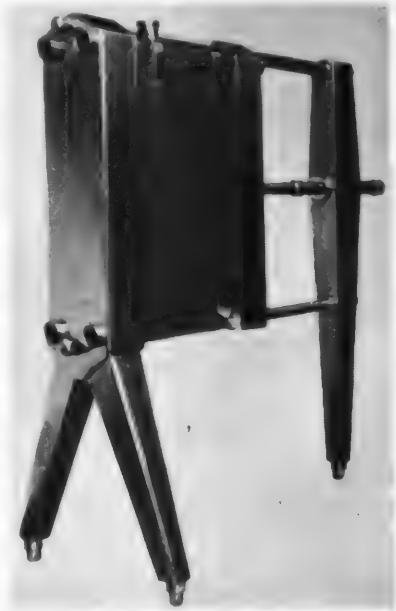
A new sound slide film on refrigerated display has been released by York Shipley.

The eight sieves of the Simon Junior sifter are enclosed in a steel case suspended by canes from a steel frame.

New Paraflow

A new Paraflow that brings the advantage of all stainless construction within the range of medium capacity duties has been designed by the A.P.V. Company to withstand pressures up to 100 lb. per square inch, thus appreciably extending its applications. On milk pasteurisation its capacity range is between 100 and 900 gallons per hour.

All its external and liquid-bearing surfaces, being of stainless steel, are easy to maintain in an hygienic condition. Single centre-bar tightening is provided and a drop bar allows quick opening and closing. The legs taper to adjustable ball feet to allow easy floor cleaning and installation on uneven floors. The ports, 2 in. in diameter, can be provided with standard British R.J.T. unions or American I.A.M.S. 3A unions.



The new Paraflow is capable of withstanding pressures up to 100 lb. per sq. in.

Sparkler Filters

The application of horizontal plate filtration, as exemplified by the Sparkler filter which has been used successfully in the paint and varnish, pharmaceutical, and general chemical industries, has now been extended to the food industries, particularly for the filtration of edible oils and cooking fats.

In an American plant in which this equipment has been installed, the filter recovers about 350 lb. of lard per week from cracklings which previously had been sedimented in the bottom of the percolator tank. The lard is filtered at a temperature of 210° to 220° F., but because of the totally enclosed features of the filter unit, there is no tendency to oxidise at this advanced temperature.

The filter is now being made in Holland and can be imported on open licence without difficulty as to currency, etc.

Public Works Equipment

Mobile cranes, concrete mixers, tractors, hoists, air compressors, power winches, and scaffold jibs were featured by George Cohen Sons and Co. at the recent Public Works Exhibition.

Mr. Ivor Massey (centre), of Maltby and Coates, Grimsby, winner of 1951-52 Procea gold cup, being congratulated by the runner-up, Mr. A. J. Eddy, of A. J. Eddy and Sons, Whitchurch, at Grosvenor House, London. On the left is Mrs. Eddy.

Sales Conference and Dinner Dance

Over one thousand bakers and their wives from all parts of Britain attended the Seventh Annual Sales Conference, Dinner, and Dance of Procea Products.

During the afternoon judging took place for the National Award, a gold cup, competed for by Procea bakers throughout the country. The cup, together with 18 area silver cups, were presented at the dinner and dance by Mr. S. A. Lancaster, the company's managing director.

The gold cup was won by Maltby and Coates (Grimsby), runner up A. J. Eddy and Sons (Whitchurch).

A special feature of the afternoon session was the stand devoted to Procea's starch production. This is the first time that the company's starch has been shown at their sales conference. Extensive research has been conducted on wheat starch, through the company's starch consultant, Mr. J. A. Radley, M.Sc. (Lond.), F.R.I.C.

Other displays consisted of photographic panels showing the latest types of bakery equipment and bakery lighting.

Principal speakers at the dinner at Grosvenor House were Mr. Harmar Nicholls, J.P., M.P., Parliamentary Private Secretary to the Postmaster General and the member for Peterborough, who spoke of the value of the baking industry and the difficulties of the small baker. Mr. S. A. Lancaster, managing director of Procea Products, responded. Dr. D. W. Kent-Jones, chairman of the company, proposed the toast of "The Guests," to which Dr. R. T. Colgate, chairman of council, Baking Industries' Research Association, and Chief Chemist and Technical Works Manager, Huntley and Palmer, replied.

War on Rats

A new type of control procedure in the destruction of rats has been developed for the use of Ratero, produced by Tobal Products. A single feeding of the treated bait is rarely fatal to rodents. Feeding must take place for at least three days; usually up to two weeks is required for complete control. The Ratero is fed to rats and mice in minute quantities which gradually induce internal haemorrhage and, eventually, death. It has never failed to kill whenever it has been taken by rats and mice on this continuous basis. Because it will continue to kill so long as sufficient bait is available, it can be considered a residual rodenticide.

The best bait material has proved to be whole, coarsely ground, yellow cornmeal, although any coarse cereal may be considered. The bait should be a material which will not mould, cake, or deteriorate as it may be exposed for two to four weeks. Therefore, the use of meats, fruits, and vegetables is not recommended except under unusual circumstances. Whole grains are complete foods and readily accepted by both rats and mice even when other food is available.

Rats will begin to die by the fifth day, occasionally earlier. Baiting should be continued until complete lack of feeding is noted. The rodents are unaware that they are being poisoned and do not associate their weakened condition with the bait. In fact, it has been frequently observed that rats, hardly able to move, drag themselves to the bait for more. When haemorrhage occurs there is no warning and no pain because the vascular system has no sensory nerve connexions. Therefore no violent reaction takes place and no "bait-shyness" develops.

Once premises are brought under control, permanent bait stations may be set up. These may be of a simple type such as a can of bait behind a board slanted against a wall, or they may be large stations with a feeder arrangement. Rats reinfesting premises will commence to feed at the stations and eventually die. Thus, permanent protection can be assured.

No resistance to Ratero develops. Rats receiving sublethal doses are readily killed when fed increased amounts or when the baiting period is extended.

An unusual and important fact is that poultry are unusually resistant to this rodenticide. In a chronic toxicity study with a hen, the hen consumed a little more than 9 g. during 14 months, an amount sufficient to kill approximately 9,000 rats.

However, the product is toxic to all mammals and fowl if it is consumed in sufficient quantity over a sufficient period of time. The low concentration, the type of bait, and the quantity required, make it highly unlikely that a human would ever be poisoned by it.

Ayrshire Canning Developments

The 45-acre estate of Eglinton Castle in Ayrshire has been acquired by Robert Wilson and Sons (Barrhead), an associate of Newforge, for the erection of extensive canning, processing, research, and training premises, and the making of gardens and other productive units.

In addition to the wide range of food products, the company also plan to develop the by-product side of the trade.

The development of this plan will take about 20 years, but the sponsors, who are receiving the support of the Ayrshire County Council, believe it to be of major importance to the area.

The centre was chosen as being the most suitable in an area of agricultural production. The unit will comprise a food division handling agricultural and sea produce by canning, bottling, quick freezing, curing, and open pack methods. A separate division will manufacture animal feedingstuffs, pet foods, compounds, and pharmaceutical products from livestock by-products.

New Can-making Factory

Work has already commenced on the new Metal Box processed food can factory at Wisbech. When completed, the factory will need 40,000 tons of tinplate per year to feed its six automatic can-making lines. It is expected that the factory, which when fully equipped will cost £600,000, will be in operation by the end of 1953.

It is intended to use local labour, and recruitment will commence shortly. When the factory is completed, it will employ approximately 350 people and produce more than 400 million food cans per year. All the machinery to be installed will be British, most of it being made in the company's own factories. It is expected that the bulk of the output of the factory will go to the fruit and vegetable canners of East Anglia.

Tomato Grading

A new tomato grader, made in Glasgow, consists of an upper spreader board to allow hand elimination of damaged fruit. The tomatoes are fed by gravity on to a series of seven divergent soft rubber horizontal belts so arranged that they drop through, according to size, while being conveyed. The floor of the unit is lined with sponge rubber to reduce shock, the exits to baskets, carried on a side rail, comprising aluminium alloy flap doors, counter-balanced by the baskets so that the doors will not open unless the baskets are in place. Powered by a ¼ h.p. motor at constant speed, the machine is designed to handle 250 baskets per hour.

A smaller unit is in process of development, with a capacity of 80 baskets per hour.

Dairy Technology Lectures

The remaining lectures in the first series on special aspects of dairy technology, arranged by Chelsea Polytechnic, are as follows:

Dec. 2. "The Manufacture of Milk Powder," by S. A. Wilcox, Aplin and Barrett.

Dec. 9. "The Design of Ancillary Dairy Equipment," by N. P. Stoate, Dairy Supply Co.

The second series is as follows:

Feb. 3. "The Use of Phosphorus Compounds in the Dairy Industry," by R. G. Stilton, Albright and Wilson.

Feb. 10. "Safety Precautions in the Dairy," by J. Hunter, Express Dairy Co.

Feb. 17. "Yoghourt and other Cultured Milk," by J. G. Davis, Express Dairy Co.

Feb. 24. "Some Impressions of the Dairy Industry in the U.S.A.," by F. C. White, Ministry of Food.

All the lectures are to be given in the Chemistry Lecture Theatre at 7.15 p.m.

Made from coated aluminium in a number of shapes, these tea caddies and biscuit barrels manufactured by Metal Box are attractively decorated with a variety of designs, and are now on sale in Britain.

Cocoa Buyer Retires

Mr. Norman Edwards, who for 46 years has bought cocoa for Cadbury Bros., has retired from the post of head of the cocoa buying department. In recent years, he has been closely associated with international cocoa conferences arranged by the Cocoa, Chocolate, and Confectionery Alliance.

Mr. Edwards was also a director of the Coomassie Cocoa Co., Cocoa Manufacturers (London), and Rowntree-Fry Cadbury (Nigeria).

Ice Cream and Tea Cheaper

Prices of the following three main ice cream lines produced by Lyons have been reduced: the Jolyrol to 2s. 6d., the vanilla gaiety brick to 1s., and the flavoured gaiety brick to 1s. 1d.

The company also recently reduced the prices of all its six packet teas by amounts varying from 2d. to 4d. a lb.

New streamlined production methods have made these reductions possible.

New Ice Cream Van for N. Ireland

Mounted on a standard Bedford 2 ton, 28 h.p. chassis, a eutectic ice cream delivery van, refrigerated by Freon-charged cold plates, has been constructed for service in Wall's Northern Irish fleet. This will be the only vehicle of its type in service with the company's fleet of 1,000 supply vehicles.

An outstanding advantage of this van will be the fact that it can operate for three days without returning to base, a great advantage in Ulster where long-distance journeys are involved.

A small engine-room, containing a compressor, enables the van to recharge its cold plates at night on being plugged in to power mains. Temperature is thus maintained at −5°F. so that the van can deliver ice cream in prime condition direct to shopkeepers three days after leaving the Belfast cold store.

Capacity of the van is approximately 850 gallons of ice cream, stored in two compartments. There is accommodation for empty ice cream cans in the engine-room compartment. Refrigeration throughout the vehicle is by Prestcold.

Paper Drinking Cups

A new lightweight drinking cup in waxed or unwaxed paper has been designed by Mono Containers. Two stock designs in one size only —7 fl. oz.—are available, and the company are also introducing a new Coronation design for 1953, to be made in 6, 7, 8, and 10 oz. sizes.

Disney Characters for Sweet Tins

A contract has been signed by George W. Horner with Walt Disney to use the famous Disney characters on their fancy tins of toffees and boiled sweets.

The agreement, which virtually gives Horners world rights to use the Disney characters, will commence with the production of a ½ lb. fancy tin using Mickey Mouse and Donald Duck as the main theme in full colour lithograph.

Introducing Larger Packs

The introduction of larger packages for a further 26 laboratory chemicals, is announced by May and Baker. The number of products available in these larger packages is now 80.

Left to right: **M. Jacobs, Jnr., Mr. Crofts, Peerless and Ericsson works manager, Birmingham, M. Jean Jacobs, Belgian agent, and Mr. Jones, designer, at a recent Brussels fair. These and other members of the party were able to see what Britain is obliged to contend with in the way of foreign competition.**

Presentation to R.S.I. Secretary

At a luncheon given by the Council of the Royal Sanitary Institute, Dr. J. W. Dudley Robinson, who will be retiring at the end of this year, was presented with an inscribed silver rose bowl and a cheque on behalf of the Fellows, Members, and Associates of the Institute as a token of their appreciation of his eminent service as secretary since 1928. Dr. Robinson has also been secretary of the Royal Sanitary Institute and Sanitary Inspectors Examination Joint Board since 1928 and of the National Nursery Examination Board since its formation in 1945.

Dr. Robinson, who ranks as one of the leading administrators of learned societies, has played an essential part in the Royal Institute's work of promoting the health of the people. Since he came to the Royal Institute from the secretaryship of the Institution of Municipal Engineers, he has been responsible for much of its successful development.

In 1936 he attended the South African Branch Conference at Cape Town and made an extensive tour of Africa. Consequent on this tour he was responsible for the preparation of schemes for establishing museums of hygiene in Cape Town, Accra, Zanzibar, and Singapore.

Dr. Robinson undertook the executive work in establishing the National Nursery Examination Board, formed at the request of the Ministries of Health and Education, and of the Examination in Nutrition in Relation to Catering and Cooking, established at the request of the English Group of the Nutrition Society. He was also concerned with the administration of the funds of the Model Abattoir Society and of the National Health Society, after they were wound up and their assets transferred to the Royal Institute.

In addition to organising the annual Health Congresses of the Royal Sanitary Institute, he was also responsible for the organisation of a number of special conferences—notably on the Midwives' Act in 1936, and on the administration of the Milk (Special Designations) Order in the same year.

Brewing and Allied Industries

An effective display of their products was featured by The Carbon Dioxide Co. at this year's Brewers' and Allied Traders' Exhibition.

The provision of carbonic acid gas for the carbonation of drinks calls for production and distribution on a large scale, and maps indicated the 10 branches and 16 depots in the British Isles on which the company's supply system is based.

In the three bays of their stand were shown the cylinders in which carbon dioxide, compressed to a liquid, is normally transported, together with blocks of Cardice and their associated converters, by means of which a steady supply of gas can be obtained from solid "dry ice." Liquid carbon dioxide can be supplied in bulk or in road tank waggons.

There was also a display of the D.C.L. Yeast and Malt Extract Department's products, which included lactic, copper, and diastatic malt extracts.

•

A wide range of automatic labelling machines, conveyor fed, was exhibited by the Purdy Machinery Co. Among those included in the display were the Tandem rotary range, the Top Strap, the Straightaway, the Turret, and the New Way labellers. In the hand-fed range were the Universal and Junior labellers.

Smokehouse Equipment

A licence has been granted to the Dowson and Mason Gas Plant Co. by Koch Supplies of Kansas City, whereby the Koch smokehouse equipment will be manufactured in Manchester.

The items consist of the following:

1. Automatically controlled gas-fired smoke tender units which generate both smoke and heat.
2. Small sectional smokehouses of 500 lb. food capacity, suitable for small bacon curers.
3. Smoke chests for application outside existing smokehouses, heated by steam coils or electricity.

The introduction of this equipment means that for the first time in Britain fully automatically controlled units, which provide both heat and smoke, will be available.

It is claimed that the smoke tender unit saves labour, watching, and supervision, and uses only about half the sawdust normally required. It reduces smokehouse fire hazard and increases capacity by controlling the smoking cycle.

Meat shrinkage is reduced with precision control and black smudge and streaks on smoked meat are eliminated. A reliable appetising finished colour is given to smoked bacon.

Colour and the Coronation

Transfers of the official design adopted by the Council of Industrial Design and of the Royal Arms for window display and other schemes for the Coronation are already available from Trapinex. They can also be supplied as mounted reproductions on coloured board backgrounds.

The quality of the pigments used ensures long life in all climatic conditions and provides the user with an after-use souvenir which will remain in good condition for years.

In addition, Trapinex paint transfers have been made and are available from stock of a number of other decorative emblems.

BOOKLETS RECEIVED

The two latest publications of the Sturtevant Engineering Co. deal with industrial drying and positive ventilation.

■

Details of the Osram fluorescent tubes, developed by The General Electric Co., are contained in a recently published leaflet.

■

Various leaflets have recently been issued by Marconi Instruments. These relate to *p*H determination, calibration tables, and the moisture meter.

■

An illustrated brochure entitled "The Story of our Bread" has been produced by Procea for distribution to children who write to the company asking how bread is made.

■

Two recent catalogues issued by Musgrave and Co. deal with the company's range of manufactures and capacities, dimensions, and characteristic curve of their fans.

■

Designed for fast freezing to ensure economical production of smooth, uniform lollipops, the Prestcold lollipop freezer is described in a newly published sheet.

■

An 80-page publication in handy reference sections, published by J. H. Fenner and Co., constitutes a working manual of mechanical power transmission.

■

Labour-saving equipment for the modern builder and the Jones mobile cranes are the subjects of two recent publications issued by George Cohen Sons and Co.

■

Advice on the organisation of tea services in offices and factories is contained in the latest booklet in the Gas Council's Commercial Uses of Gas series, entitled "Tea at Work." It has been produced in co-operation with the Tea Bureau and costs 3s.

■

COMPANY NEWS

A net profit for the period from April 1, 1951, to March 29, 1952, of £993,906 after taxation, as compared with £912,310 in the previous period, has been announced by Allied Bakeries. Dividends of 30 per cent. on the Ordinary capital have already been declared.

■

The Directors of Weston Foods have declared in respect of the period from April 1, 1951, to March 29, 1952, on the Ordinary share capital of the company, an interim dividend of 30 per cent. less income tax, for the year, which is the same as the total of the two interim dividends declared in respect of the previous period.

The total consolidated profit of the company and its subsidiaries amounts to £1,324,454 (against £1,187,036 last year) and after all charges and taxation there remains for distribution and appropriation £522,761 (against £469,341).

The sum of £252,995 has been reserved in respect of goodwill (against £300,000) and £100,000 has been transferred to general reserve (against nil) leaving £90,808 to be carried forward (against £86,417) after provision for the Preference and Ordinary dividends for the period.

■

Employees who participate in the profit-sharing scheme of Quickfit and Quartz will this year receive a bonus of 8 per cent.

This decision has been taken at a meeting of the company's main profit-sharing committee, presided over by Sir Graham Cunningham, chairman and managing director of the group.

■

As a result of two years' satisfactory profits, the directors of Lovell and Christmas recommended the payment on the Ordinary stock of a 6 per cent. dividend, plus a bonus of 2 per cent., after the necessary appropriation for debenture stock redemption and interest and prescribed dividend on the Preference stock.

■

Interim dividends have been declared by the directors of J. Lyons and Co. on account of the year ending March 31, 1953, of 1s. per £1 unit on the Ordinary and "A" Ordinary Stocks and one-fifth of this amount, *viz.* 2·4d. per £1 unit or share respectively on the Proportional Profit Stock and "B" Proportional Profit Shares.

These dividends are payable on December 1, 1952, and are subject to income tax at 9s. 6d. in the £.

■

The part played by those concerned with the newer knowledge of nutrition and with the products of the pharmaceutical industry in the tremendous decrease in the death rates compared with 50 years ago was mentioned by Mr. H. C. H. Graves, chairman of Vitamins Ltd., at the annual general meeting.

The trading profit at £41,518 should be compared not only with the last year's record figure of £63,755, but also with the previous figure of £10,870. The recession was due to the decision not to increase selling prices in 1951—a decision abundantly justified by the effects on turnover.

OBITER DICTA

● A man who has a row with his wife at the breakfast table might as well put his breakfast in the dustbin.—*Dr. Charles Hill, M.P.*

● If ever a country buys rubbish for the production of canned food, this does.—*Mr. A. Samson, to members of the Food Manufacturers' Federation.*

● The Ministry of Food is the biggest take it or leave it firm in the business.—*Mr. G. Squire, President, National Federation of Meat Traders' Associations.*

● Not only does a new vacuum cleaner now being advertised make mayonnaise, beat eggs, and grind coffee, but you don't have to marry it.—*"Fun and Fiction," Canada.*

● Housewives and restaurateurs might well express concern about the growing use of strong insecticides on growing vegetables. Is a cabbage which has been sprayed with parathion really fit for human consumption?—*"Lady."*

● Where are the foods we used to enjoy? It's a question many an older housewife asks herself as she presents her husband at breakfast with small wizened black objects he refuses to call prunes.—*"Manchester Evening News."*

● Remember all those exotic "meats" the Ministry of Food tried on our steak-starved palates? "Macon" was a Ministry attempt to make bacon out of mutton during the war. Mercifully the fabulous peep (or shig) died and has not been revived again.—*Gwen Robyns, "Evening News."*

● Hello, all you nice meat men! I know you are nice people. Here you are letting me talk. I can't help thinking your committee showed a sense of perfect type-casting in placing the fat Mrs. Rindlaub in the sausage section!—*Mrs. J. W. Rindlaub, at the 47th Annual Meeting of the American Meat Institute.*

● If the steelworker thinks that after a week in front of the furnace he is entitled to a tin of imported pineapple chunks, I can explain that the resultant girders do not inevitably swop for exotic fruit. They go into new Government offices; we are producing some of the finest Government office accommodation in the world.—*"Sunday Times."*

World Food News

FORTHCOMING EVENTS

International Nutrition Congress

At a meeting of the Executive Committee of the International Union of Nutritional Sciences, it was unanimously decided to accept the invitation of the Netherlands members to hold the third International Congress of Nutrition in Amsterdam in the summer of 1954. Prof. E. J. Bigwood (Brussels) was re-elected chairman of the Committee and Dr. Leslie J. Harris (Cambridge), Honorary Secretary. The following national, or organisational, representatives served on the Committee:

Prof. E. J. Bigwood (Belgium).
Dr. Morley Whillans (Canada).
Prof. H. Dam (Denmark).
Prof. A. I. Virtanen (Finland).
Prof. E. Terroine (France).
Prof. H. Kraut (Germany).
Dr. M. Demarchi (Iraq).
Dr. F. Mancini (Italy).
Dr. A. Seliskar (Jugoslavia).
Dr. M. van Eekelen and Prof. B. C. P. Jansen (Netherlands).
Mrs. B. Q. Werenskiold (Norway).
Prof. E. Abramson (Sweden).
Prof. K. Bernhard and Prof. F. Verzár (Switzerland).
Mr. A. L. Bacharach and Dr. L. J. Harris (United Kingdom).
Dr. S. G. Greenberg (U.S.A.).
Dr. W. R. Aykroyd (Food and Agriculture Organisation).
Dr. T. Norris (World Health Organisation).
Dr. D. P. Cuthbertson (Scottish Group, The Nutrition Society).
Miss D. F. Hollingsworth (International Dietetic Congress).

C.I.P.C. Committee meet in Madrid

The annual meeting of the *Comité International Permanent de la Conserve*, held in Madrid, was attended by over 80 delegates and technical advisers from Belgium, Denmark, France, Holland, Morocco, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Delegates discussed reports of the sub-committees concerned with the study of standardisation, definitions, and regulations affecting canned foods. The Scientific Sub-committee has continued its examination of problems classified under nutrition, analysis, legislation, and bacteriology; a new section to study the behaviour of the container for canned foods in all its aspects was formed, also a new committee to study the public's interest in canned foods.

Sugar Booklet

The types, uses, and food value of sugar are described in a booklet which has recently been issued by Sugar Information Inc.

Margarine Prices Freed

Under an Order made by the Minister for Industry and Commerce, on the recommendation of the Prices Advisory Body in Ireland, Irish margarine is now free of price control.

Control was introduced during the war when only limited quantities of ingredients for margarine manufacture could be obtained. Ample supplies of raw materials are now available. Present price of margarine in the Republic of Ireland is 1s. 8d. lb.

Quick Frozen Delicacies

The wide line of specialities now frozen by Golden Palace Food Products includes various chow mein, including chicken chow mein.

The products are scientifically processed in a specially prepared kitchen, using the delicate Mung bean sprouts in preference to the more strongly flavoured soy sprouts. The Mung bean sprouts are grown on the premises in clear water and used within an hour or two of picking. When the products are cooked, they are immediately packaged and quick frozen.

OVERSEAS ENQUIRIES

Agency for Foodstuffs

The Caribbean General Agency, P.O. Box 80, Castries, St. Lucia, British West Indies, wish to contact United Kingdom firms requiring agency representation on a commission basis in St. Lucia only for baking powder; custard powder and allied lines; and cocoa powder packed in 7 lb. paper bags and ¼ lb., ½ lb., and 1 lb. tins.

The firm which holds agencies for certain United Kingdom, Canadian, and South American houses for food lines, is in touch with buyers of the items for which connexions are now being sought.

Firms interested in this enquiry should communicate with the enquirers direct.

*

Frozen Fish Fillets

Wickers Fish and Poultry Co., of 3004, Gaston Avenue, Dallas, are interested in receiving quotations for frozen fish fillets.

Consignments should be packed in 10 × 5 lb. cartons, cellulose wrapped, in master cardboard cartons of 50 lb. It is understood that the firm normally buy in 25,000, 50,000, and 100,000 lb. lots and are at present importing direct from Iceland and Newfoundland.

Interested firms, who are reminded that products for America are subject to the U.S. Food and Drug Administration regulations, should submit by air mail quotations in dollars, c.i.f. New York direct to the company.

*

Cocktail Biscuits

Mr. M. L. Corneo, of the Case International Co., 1900, Superior Avenue, Cleveland, Ohio, is interested in receiving offers from United Kingdom manufacturers of cocktail biscuits of all types or cocktail snacks, who are not already represented in the Midwest.

United Kingdom firms interested in this enquiry are asked to communicate by air mail direct with Mr. Corneo, quoting prices c.i.f. East Coast port and giving delivery dates. No samples should be sent at present.

*

Foodstuffs and Beverages

The C. J. McNeely Co. of Hall Building, 789, West Pender St., Vancouver, wish to contact United Kingdom firms requiring agency representation, on a commission basis, in British Columbia and Alberta, for high quality biscuits, tinned meats, preserves, such as candied peel, liquorice allsorts, and hard boiled sweets.

These products are subject to the requirements of the Canadian Food and Drugs Act and Regulations, details of which are available from the Commercial Relations and Exports Department of the Board of Trade.

Douglas M. Kenrick (N.Z.) Ltd., P.O. Box 1763, Auckland, New Zealand, wishes to represent United Kingdom exporters of foodstuffs and beverages.

The company offer nation-wide representation in New Zealand to manufacturers (or to their appointed agents) of all classes of food products including prepared and bulk merchandise.

It should be noted that the following items of foodstuffs are prohibited under New Zealand Tariff Regulations: tomato sauces and chutneys, cake and biscuits, jams and marmalades, confectionery, and cocoa.

Money Order Service

An international money order service, enabling German importers to pay for goods to the value of DM. 100 without the necessity for obtaining import licences, came into force between Great Britain and the German Federal Republic (including the Western sectors of Berlin) on October 1, 1952.

Graphic Arts Exhibition

Three types of printing machine were included among the exhibits of the Société Garamont at the Graphic Arts Exhibition held in Paris from October 23 to 31.

These machines are manufactured by Vickers-Armstrongs at their Elswick Works to the designs of the American Type Founders (Inc.).

Ireland's New Gelatine Factory

French technicians have arrived in Dungarvan, Co. Waterford, to provide assistance in the manufacture of first quality food gelatines to be made by a new Irish company, Rousselot Casey Gelatine. Hitherto Ireland imported food gelatines.

The Rousselot Casey Co., with its 14 factories, is one of the biggest firms engaged in the production of food gelatine in Europe.

Fish Canning Expansion

Seven new fish canning plants are expected to come into operation in South Africa during the next 15 months, according to the Department of Commerce and Industries. The South West African Administration has also indicated its willingness to license another two plants.

The 38 million lb. fish pack in 1950-51 is expected to be increased to 48 million lb. in 1951-52 and to at least 72 million lb. in 1952-53. Overseas demand is still far in excess of supply.

Moisture Analysis

Comprising three separate units—the master measuring unit, the sampling unit consisting of electrode and sample cup, and the hydraulic press with pressure gauge—an instrument for the determination of the moisture content of granular or powdered products has been developed by the Moisture Register Company of California.

To make a moisture analysis of a material, a sample of it is placed in the sample cup, then compressed to a predetermined pressure in the hydraulic press. The moisture content is instantly read on a microammeter as soon as the appropriate plug-in range box is inserted at the base of the measuring cup.

Slaughterhouse Wastes

The bibliography and abstracts presented in "Slaughterhouse and Packinghouse Wastes," by Donald D. Gold, of the Engineering Experiment Station, The University of Tennessee, have been prepared as part of a programme instituted by the University for the investigation and study of industrial waste treatment and stream pollution.

Dr. Richard H. Forsythe.

Award for Technical Paper

The cash award offered by Monsanto Chemical Co. for the best technical paper delivered at the Annual National Meeting of the Institute of Food Technologists, was won by Dr. Richard H. Forsythe for his paper on "Factors Affecting the Microbiological Population of Shell Eggs."

Dr. Forsythe is affiliated with the Research Division of Armour and Company in Chicago. He was recently appointed an Assistant Director of the Development Department, directing dairy and poultry research. He was formerly Assistant Professor in the Poultry Husbandry Department of Iowa State College, teaching and directing graduate research in poultry products and food technology.

Queensland Food Farm Break-up

Queensland's Labour State Cabinet has decided to break up the Queensland-British Food Corporation food farm in Central Queensland.

It is understood that the State Government would recommend to the British Government that the project be subdivided for closer settlement or limited to large scale experimental farms to be operated by the Corporation or State Government, depending on whether the British Government wants to abandon the scheme immediately.

According to a Brisbane paper, the British Government would be reimbursed over a long period for its outlay, which is now A£1,187,000.

X-ray Grain Inspection

Designed for the inspection of sample grains of wheat to determine whether they meet insect-content specifications of the U.S. Food and Drug Administration, a new X-ray unit, developed by the Westinghouse Electric Corporation, can run a complete X-ray test in 15 minutes.

Vitamins from Tobacco Waste

Nicotine sulphate, nicotinic acid, and other products are being extracted from tobacco waste by the National Chemical Laboratory at Poona. South Indian tobacco growers, who produce nearly 44 per cent. of the total production in the country, are keenly interested as much tobacco waste is put to no economic use at present.

Hungary's New Strawberry Varieties

Considerable experiments are being conducted in Hungary in improving soft fruit varieties. Much of the research is carried out at the Fertöd Experimental Farm, near Sopron, in Western Hungary, which is managed by Mr. Aladár Porpáczy, who received one of the annual Kossuth Prizes last year for his work on fruit growing and on acclimatising lemons in Hungary.

Three new varieties of strawberries produced at Fertöd are now being widely grown in Hungary. One is the Early-E, a large, early ripening fruit suitable for large scale cultivation. The second variety is the Export-E, a kidney-shaped fruit with a firm flesh, which stands up well to long distance transport and is also suitable for canning. The third variety, the Huge-E, bears a large fruit weighing from one and a half to two ounces.

Flour Packaging

Operators in the bagging room of a flour company in the U.S. have designed and built their own automatic sealing machine without purchasing costly equipment.

The bags for the flour are of an impermeable type and require a waterproof seal at both ends. The waterproofing is considered adequate only if the sealed bags can actually float on water when tested. Consequently, each end of the bag is thoroughly sealed with wax.

Formerly the melted wax was applied by a brush dipped into the wax from a melting pot—a slow and painstaking process. To convert this to a rapid production line operation, the mill workers equipped a steel drum with an electric immersion heater and added a thermostat control which keeps a day's supply of wax at a few degrees above the melting point. The drum was placed by the side of the belt conveyor that carries the bags from the stitcher. A metal trough was erected beside the conveyor to carry a supply of hot wax from a spigot-nozzle at the base of the heating drum.

As the bag reaches the metal trough, a stitched end is forced below the level of the wax by a curved board. The bag is then guided out of the box by an angle iron which is mounted inside the trough.

News from the Ministries

Resignations

Mr. F. F. Pinnock, C.M.G., Overseas Supplies Commissioner to the Ministry of Food, has relinquished his appointment.

*

Mr. C. F. Cumberlege has resigned his appointment as Director of Tea with effect from October 31, 1952. In response to the request of the Minister of Food, Mr. Cumberlege has agreed to act as Adviser on Tea to the Ministry.

*

The resignation has been announced of Mr. E. R. Greene, Director of Coffee, with effect from September 30, 1952. In response to the Minister of Food's request, Mr. Greene has agreed to act as Adviser on Coffee to the Ministry.

Island Sweets

Distributors of chocolates and sweets in the Channel Islands and in the Isle of Man hitherto were able to obtain their supplies only from firms on the mainland with whom they dealt before the war. It has now been decided to remove this restriction and to leave distributors in these islands free to select their suppliers, provided they comply with certain administrative arrangements, the details of which will be supplied on application to the Ministry of Food, Bakery and Confectionery Division, London Road, Stanmore, Middlesex.

Tin Container Restrictions Lifted

All general controls on the use of tinplate (including terneplate and blackplate) in containers and packaging were removed on October 20. As tinplate remains scarce and is still subject to allocation, the revocation of the control does not mean that there will be any immediate increase in the amount available for packing. The size of the allocations will depend on the general steel position, on the supplies available, and the uses to which they are put.

The can makers have given an assurance that they will exercise restraint in the introduction of new types, and will pay special attention to the need for economy in tinplate. It is hoped that the greater flexibility in production which will follow decontrol will enable them to provide more effectively for both home and export needs.

Existing controls have limited the sizes and shapes of containers (of less than one gallon) which could be used for packing goods for the home market. The class of goods which could be packed in any given type of can have also been limited, as have the amounts of printing on cans and crown corks. The extensive war-time controls on packing materials had already been relaxed and the present change sweeps away the last remaining control on packaging as such, although certain specific restrictions are still embodied in orders of other Ministries which relate principally to other matters.

Grapefruit Contracts

More than five million cans of grapefruit segments from next seasons' crop will start reaching the shops next spring.

Contracts have been concluded with the Commonwealth countries under which the United Kingdom should receive not less than 90,000 cases from Jamaica, 100,000 cases from British Honduras, and 20,000 cases from South Africa. Each case contains 24 cans of 20 oz. net weight content.

The Bread Order, 1952

The Bread Order, 1952, which came into force on October 12, 1952, and replaced the Bread Order, 1951, as amended, is a consolidating Order, the only new provision being that a new brand of bread (Petana) made from gluten-enriched flour has been added to the list of breads that can be sold free of price control, provided the seller has national bread on sale at the same time.

Biscuit Prices

In accordance with the practice of removing price controls on food where these no longer serve a useful purpose, sweet, semi-sweet, and chocolate biscuits were freed from such control as from October 5, 1952.

Since all other biscuits were freed from price control on February 10, 1952, the Biscuits (Prices) Order, 1951, has been revoked with effect from October 5.

Heating of Grain

The purpose of a recent advisory leaflet issued by the Ministry of Agriculture, published by H.M.S.O., is to describe what happens when grain heats, to explain how heating starts, to show how to prevent heating, and how to deal with it when it occurs.

Chemical Agents in the Dairy

Approval has recently been given under the Milk and Dairies Regulations, 1949, for the use of the sodium hypochlorite solution Sterylclean as an oxidising or preservative agent in the cleansing of dairy utensils.

Dried Fruit Prospects

There is to be rather more dried fruit available this Christmas than last. Supplies will consist of sultanas and currants from Australia, the Near East, and the United States.

As part of its purchases of dried fruit for distribution next year, the Ministry of Food has made a contract with the United States authorities for 50,000 short tons of Californian sultanas. First shipments will arrive in the New Year.

Mineral Oil in Dried Fruit

The Mineral Oil in Food Order, 1949, has been further amended so as to reduce the amount of mineral oil that may be present in prunes, currants, sultanas, and raisins from one per cent. to 0.5 per cent. The amount of mineral oil that may be present in manufactured foods as a result of the inclusion of these dried fruits is correspondingly reduced.

The amending Order came into force on October 19, 1952.

Australian Meat

Following discussions in London between representatives of the Australian Government, the Australian Meat Board, and the British Ministry of Food, it has been agreed that the prices to be paid by the United Kingdom for beef and veal during the year to September 30, 1953, shall be increased by 20 per cent. Meat shipments to the United Kingdom in the coming year are expected to be substantially higher than in 1951-52.

Sweet Licences Abolished

Licences to sell chocolate, confectionery, sugar confectionery, and chocolate couverture by wholesale were abolished from October 31, 1952. The licensing of retailers of chocolate, chocolate confectionery, and sugar confectionery was abolished on October 1, 1952.

New entrants to the wholesale sweets trade will need a personal points banking account and an allocation of personal points before they can begin trading. People who propose to sell sweets by wholesale for the first time should apply to their Regional Food Office for further information and advice.

Information and Advice

This Service is available for subscribers to FOOD MANUFACTURE. Postal replies will be sent if a stamped, addressed envelope is enclosed with enquiries.

Marzipan

B.6097. *Could you please give us a formula for marzipan?* (Ireland.)

The following formula may be used as a basis for experiment:

Granulated sugar	60 lb.
Corn syrup	14 lb.
Ground almonds	30 lb.
Fondant	14 lb.
Glycerine	4 fl. oz.
Almond oil	¼ fl. oz.

The almonds are sorted, blanched, and refined, and placed in a U-shaped mixing machine. The sugar and corn syrup are cooked in a steam pan to 250°F. The cooked batch is poured on to the ground almonds, and the fondant and glycerine added. After mixing thoroughly, the batch is cooled and passed through the refiner. The marzipan may be rolled into sheets of any desired thickness and cut into bars which are crystallised.

Alternatively, the paste may be worked into mosaic patterns and drawn out after the fashion of boiled sugar batches into variously shaped rods; these are cut into pieces on a guillotine, and then crystallised in syrup at 34° Baumé for six hours.

Ham Cooking

B.6037. *Could you please provide us with methods for cooking and baking ham, and also a suitable costing system?* (Salop.)

With regard to a suitable costing system when pricing out the finished ham, the sales figures should be based only on the weight before cooking. Boning and trimming will account for a loss amounting to 20 per cent. of the original weight, and the cooking will cause a further wastage of about 20 per cent. of the prepared weight. To arrive at the actual cost of the finished article, it is necessary to multiply the original cost by the original weight and divide the answer by the weight after the cooking. Gross profit should then be added to this.

Assuming that a gross profit of 33⅓ per cent. on sales is required, the following sum should be worked out in order to find the selling price:

$$\frac{\text{"P" pence}}{1} \times \frac{\text{original weight}}{\text{weight after cooking}} \times \frac{3}{2} = \text{sale price in pence per lb.}$$

where "P" pence is the original cost price. If the desired profit is to be 25 per cent., the multiplying factor should be ⅓, and if the margin is to be 50 per cent., the corresponding factor is ½.

The cooking of ham should be carried out at a temperature of 170°F. and, as a rough guide, about 25 minutes should be allowed for every pound of meat. Care should be taken to prevent the losses from exceeding 20 per cent. of the uncooked weight, which may be done by reducing the temperature and increasing the time of cooking. Another way is to plunge the ham into water heated to just over 200°F. The source of heat is then removed, and the copper and lid are packed round with sacking, so as to retain the heat for as long as possible. The pack is left undisturbed until the following morning. Although this method is naturally slower, it helps in the reduction of cooking losses. It does, however, affect the keeping qualities, and must be used with discretion during hot weather.

Loss of weight in baking ham by normal methods would prove prohibitive, but the following method produces a form of baked ham which might be commercially successful.

The ham is first cooked in water at 160°F., allowing 23 minutes per pound of ham. The skin is then removed, and the ham is baked in an oven, and basted with a paste prepared from brown sugar and vinegar, which has been previously heated to a thick syrup-like consistency. The ham should be allowed to cool off slowly and set thoroughly before carving.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.5976. *Compression equipment.* (Norway.)
B.5977. *Pea suction device.* (Lancs.)
B.5978. *Fruit and vegetable canners.* (Lancs.)
B.5979. *Ham canning.* (London.)
B.5980. *Lecithin.* (Scotland.)
B.5981. *Mincemeat.* (Yorks.)
B.5982. *Chicken and ham paste, and soup blocks.* (Ireland.)
B.5986. *Automatic control for mixing plant.* (Staffs.)
B.5987. *Pumping equipment.* (Australia.)
B.5988. *Cooling conveyor.* (New Zealand.)
B.5990. *Jelly crystals.* (India.)
B.5993. *Popcorn.* (London.)
B.5995. *Weighing equipment.* (Ireland.)
B.5996. *Polyethylene.* (Middx.)
B.5998. *Meat pie pastry.* (N. Ireland.)
B.5999. *Piping jelly.* (London.)
B.6000. *Bacon brine.* (N. Ireland.)
B.6010. *Dehydrated mushroom.* (Australia.)
B.6011. *Bottling pears.* (London.)
B.6012. *Quick freezing and deep freezing.* (Suffolk.)
B.6013. *Citrus squashes.* (India.)
B.6014. *Can cleaning equipment.* (Denmark.)
B.6016. *Synthetic cream.* (N. Ireland.)
B.6018. *Essential oils.* (Canada.)
B.6020. *Plastic ware.* (Lincs.)
B.6022. *Cider presses.* (Ireland.)
B.6023. *Pest control.* (London.)
B.6024. *Drying ovens.* (S. America.)
B.6027. *Quick frozen bacon and eggs.* (America.)
B.6028. *Canning equipment.* (Staffs.)
B.6029. *Ghee.* (Herts.)
B.6030. *Filter bags.* (Yorks.)
B.6031. *Sunflower flour and crude black molasses.* (France.)
B.6032. *Technical education.* (Kenya.).
B.6034. *Hydrogenated fat.* (Glos.)
B.6035. *Lard tins and earthenware vessels.* (Yorks.)
B.6038. *Sodium bisulphate.* (Durham.)
B.6042. *Pasteurisation of liquid egg.* (London.)
B.6055. *Chop sauce and candied pineapple.* (Essex.)
B.6056. *Retort for fish.* (Durham.)
B.6057. *Bacon smoking.* (Glos.)
B.6058. *Labelling machines.* (Lancs.)
B.6059. *Ham cookers and presses.* (Warwicks.)

Recent Patents

680,481. National Biscuit Co.: Apparatus for dip-coating cookies and the like.

680,583. Soc. Francaise des Regulateurs Universels Arca, and Teneur, L.: Automatic control devices for sugar boiling.

680,703. Procter and Gamble Co., and Williams, W. P.: Production of confectioners' hard fat.

680,832. Howard, Ltd., E. R., and Painter, A. S. J.: Liquid atomising spray devices.

680,836. Poole, R.: Fluid delivery nozzles.

680,870. Rose Bros. (Gainsborough), Ltd.: Feeding of loaves or the like through slicing mechanisms.

680,889. Nederlandse Organisatie voor Toegepast — Natuurwetenschappelijk Onderzoek ten Behoeve van de Voeding: Process for the preparation of a butter which does not develop a fishy off-flavour in cold storage.

680,922. Gardiner, L. A. J.: Compressor units for refrigerating apparatus.

681,015. Reflex Manufacturing Co., Ltd., Elgar, N. E. B., and Shaw, J.: Milk coolers.

681,052. Algemene Kunstzijde Unie N.V.: Preservation of food.

681,064. Berglind, N. W.: Machines of the household type for cutting, mashing, and whipping fruits, vegetables, and the like.

682,059. Arenco Aktiebolag: Device for positing fish in a fish treating machine.

682,064. Nyrop, J. E.: Preservation of perishable liquids.

682,077. Henkel, A. A.: Drum press for the treatment of cords of plastic material, more particularly a sugar mass.

682,133. Hunt, H. R.: Tea plucking machines.

682,205. Eastman Kodak Co.: Antioxidants for oils and fats.

682,374. Lamb, H. F.: Mixing and mincing machines.

682,379. Plastray Products (Birmingham), Ltd.: Ice forming cups or the like for use in refrigerators.

Abstract of a Recent Specification

Packing Food Products

This invention concerns an improved method of packing raw or uncooked food products in order to facilitate their distribution and selling, as well as the cooking thereof.

More particularly, its object is to eliminate, both from a labour-saving and from a hygienic point of view, all handling of such food products from the moment they leave the producer until they are ready for consumption.

The method comprises cleansing the food products and dividing them, if desired, into pieces of appropriate size, placing the products, together with any desired matters to be added, such as salt and seasoning, in a container of a flexible transparent impervious film capable of withstanding cooking temperatures, partially evacuating the container, and hermetically sealing it with the products therein. The volume of the container is so large in relation to the total volume of the food products that after the partial evacuation there will be ample space for the products inside the container, so that the excess portion of the container may be used as a handle for carrying the container without squashing the food products therein. The products are subjected to a cooking operation while still in the hermetically sealed container, so that the steam produced during this operation will be retained in the container, thereby inflating it and causing a slight increase of pressure therein. The container is opened for removal of the products only after the cooking operation is finished, so that the food products as removed from the container are ready for serving.

The sealed container with the products therein is transported to the retailer, where, after freezing, if desired, the container may be kept in a refrigerator or otherwise stored, and, after being sold, may be carried by the consumer and prepared by cooking without being removed from the container.

676,369. *Sten Erik Otto Wilhelm Erasmie.*

Trade Marks

MERTONA.—703,995. Powdering products for bakers. **United Phosphate and Malt Company, Limited,** Uphosma House, 22/24, Chase Road, London, N.W.10; Manufacturers.

SUN D'OR.—704,460. Sugar, non-medicated confectionery, chocolate, cocoa, preparations flavoured with chocolate or cocoa for making beverages, and crystallised ginger. **Alfred Howard Scrase, Maurice Robert Scrase, George Percival Clarke,** and **Winifred May Geering,** trading as **Young, Randall and Company,** 77, Lansdowne Road, Croydon, Surrey; Manufacturers.

STIM.—704,885. Condiments, flavourings (other than essential oils), and seasonings, none being for animals. **Fredk. Boehm, Limited,** 19, Bentinck Street, London, W.1; Chemical Manufacturers and Merchants.

GOLDEN VALE.—705,343. Jam and marmalade. **MacMurray, Limited,** Graigleith Preserve Works, 84, 86, 88, and 90, Johnstone Street, Alva, Scotland; Manufacturers.

HAXKAF.—705,508. Coffee and preparations for making beverages with a coffee flavour. **Edward Hack, Limited,** Lion House, Red Lion Street, Holborn, London, W.C.1; Manufacturers.

ALP FARM.—705,770. Cheese. **Hagemanns Creameries, Limited,** 1, Watergate, Tudor Street, London, E.C.4; Manufacturers.

PAREX.—705,944. Edible oils and edible fats. **Towers Creameries, Limited,** Towers Factory, Commonside East, Mitcham, Surrey; Manufacturers and Merchants.

SOUTHERN MAID.—706,460. Edible oils, edible fats, edible oil emulsions, and edible fat emulsions. **The Southern Oil Company, Limited,** Westinghouse Road, Trafford Park, Manchester; Merchants.

NEW BRIAR.—706,745. Meat, fish, tongue, hearts, kidneys, and fruit, all being canned foodstuffs. **New Briar Trading Company, Limited,** Northgate House, Moorgate, London, E.C.2; Merchants.

CASSOMLO.—707,837. Sausage skins and gut for making sausage skins. **Oscar Sommer,** 104, Clifford's Inn, Fleet Street, London, E.C.4; Manufacturer and Merchant.

Recent patents and trade marks have been selected from the "Official Journal of Patents" and the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

New Companies

R. Pacey, Limited. (510668.) 12, Southgate Street, Winchester. To carry on business of importers, exporters, and manufacturers of and dealers in bakers' and confectioners' machinery, plant, appliances, etc. Nom. cap.: £1,000 in £1 shares. Man. dir.: R. G. Pacey, Gratton House, Sutton Scotney, nr. Winchester.

Dorset Concentrates and Minerals, Limited. (510755.) To carry on business of animal nutrition specialists and experts, manufacturers of and dealers in vitamin and mineral extracts and concentrates, etc. Nom. cap.: £10,000 in £1 shares. Dirs.: not named. Subs.: F. E. Davis, 10, Ulric Street, London, S.E.5 (sec.), and Miss M. G. Alderton, 15, Regent Square, London, W.C.1.

J. Adams (Casings), Limited. (510803.) Stanley Abattoir, Liverpool, 13. To carry on business of preparers of sausage casings, etc. Nom. cap.: £4,000 in £1 shares. Dirs.: J. O. Adams and Mrs. M. F. Adams, 6, Lisleholme Close, Liverpool.

North West Frozen Foods, Limited. (510813.) Victoria Buildings, Victoria Square, Cleveleys, Lancs. Nom. cap.: £10,000 in £1 shares. Dirs.: R. G. Davies and Lilian F. Davies, Wayside, Whiteside Way, Cleveleys, Lancs.

Midgley and Parkinson (1952), Limited. (510847.) To carry on business of manufacturers of and dealers in jam, honey, marmalade, preserves, sauces, foods, and foodstuffs and provisions, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: not named. Subs.: L. Pearson, 6, Green Lane, Pudsey, and Mrs. M. Marr, 2, Radcliffe Gardens, Pudsey.

Kosher Meat Products, Limited. (511357.) 30, Lancefield Street, Ladbroke Grove, London, W.10. Nom. cap.: £100 in £1 shares. Dirs.: F. Frohwein and Grete Frohwein, 11, Grosvenor Gardens, London, N.W.11.

Top Value, Limited. (511420.) Fleet Street, Burton-on-Trent, Staffs. To carry on business of manufacturers of and dealers in coffee and other essences, and preserved, prepared, patent, malted, cooked, and concentrated foodstuffs, etc. Nom. cap.: £100 in £1 shares. Dirs.: A. L. Oxford, Broadstone, Ticknall, nr. Derby (perm. dir. and ch.); A. T. Ree, 66, Stanton Road, Burton-on-Trent.

Collapsible Box and Packing Case Company, Limited. (511435.) Columbia House, Winchcombe Street, Cheltenham. Nom. cap.: £2,000 in £1 shares. Dirs.: to be appointed by subs. Subs.: W. H. C. James, 188, Bedford Hill, London, S.W.12 (secy.); Hilda Pelton, 66, Ridgemount Gardens, London, W.C.1 (secy.).

R. Gordon Booth and Company, Limited. (511478.) 68, Beaumont Avenue, St. Albans. To carry on business of manufacturers of and dealers in foodstuffs, etc. Nom. cap.: £100 in £1 shares. Permt. dirs.: R. G. Booth (man. dir. and ch.) and Anne Booth, 68, Beaumont Avenue, St. Albans.

Caldar Company, Limited. (511960.) To carry on business of importers, exporters, merchants, and manufacturers of and dealers in foodstuffs of all kinds, etc. Nom. cap.: £100 in £1 shares. Dir.: R. Calzada, 39, Ossington Street, London, W.2; Sub.: Eloisa V. Dario, 18, Mount Street, London, W.1.

From Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C.2.

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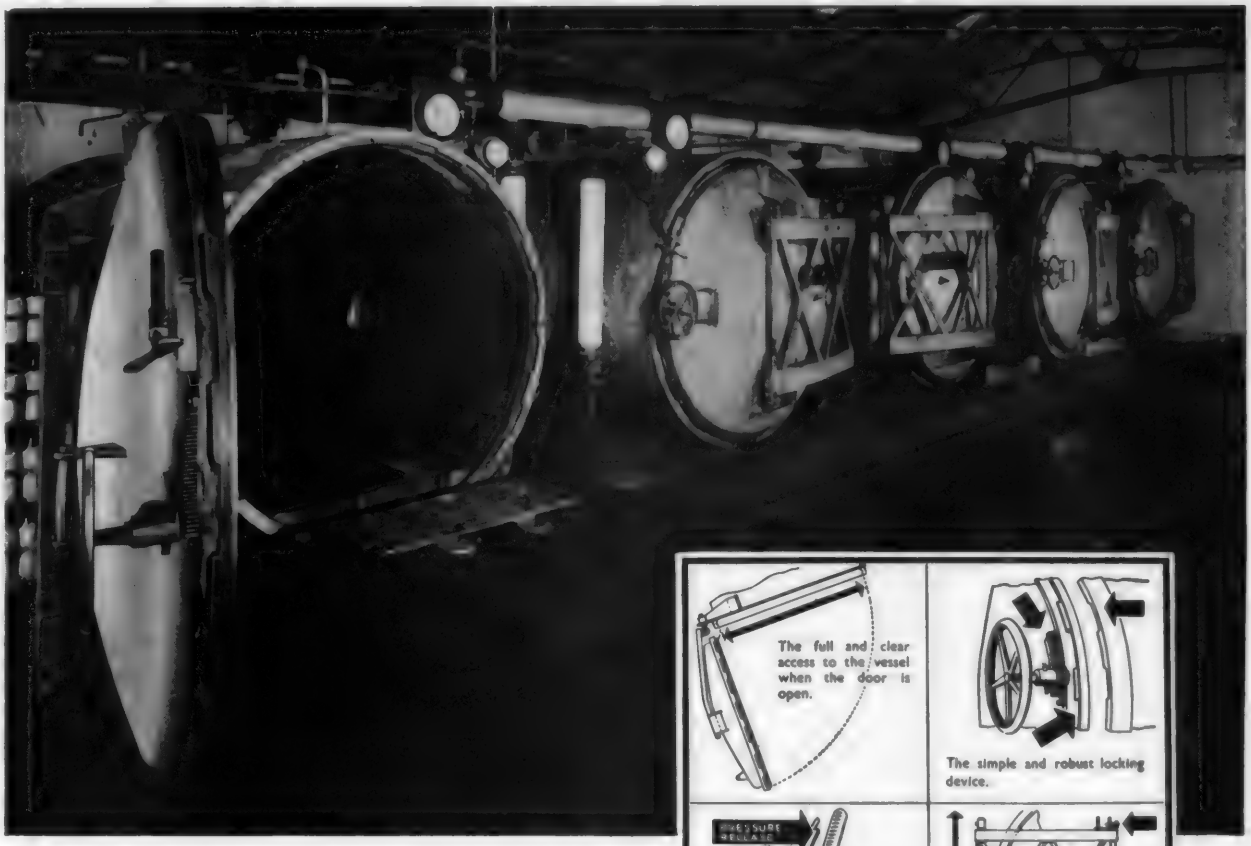

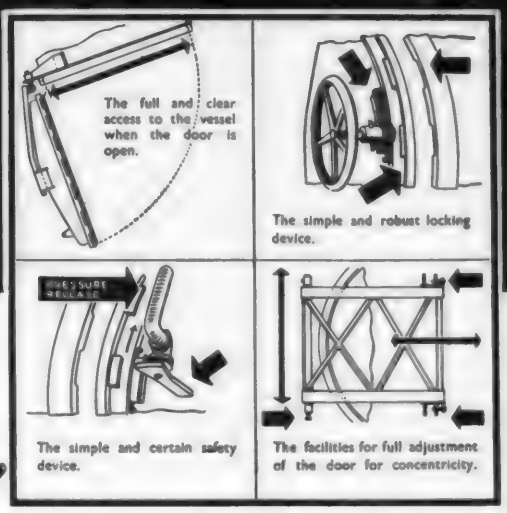
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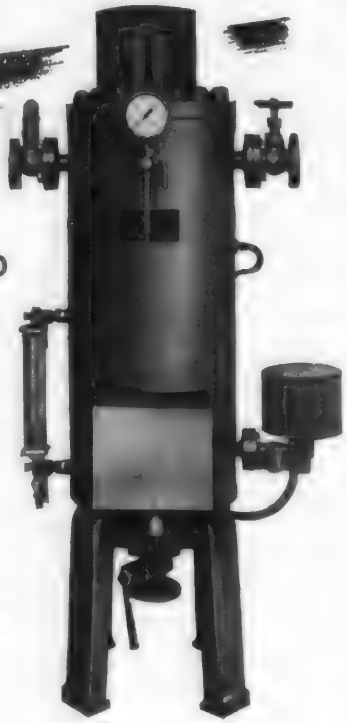

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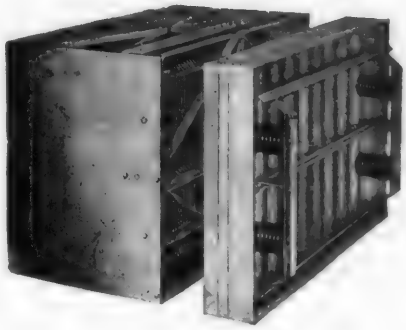

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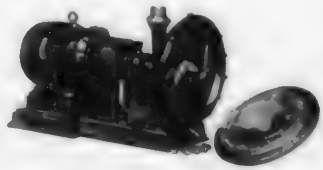

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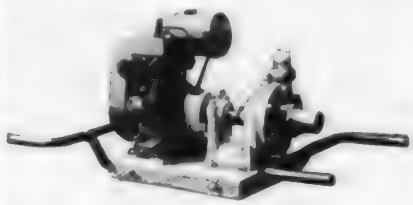

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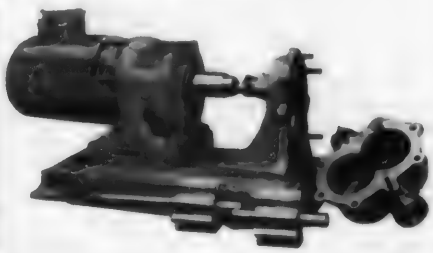

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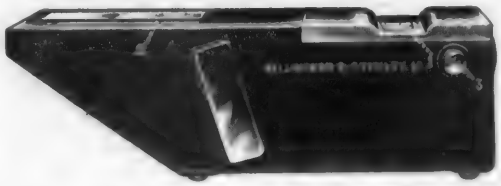

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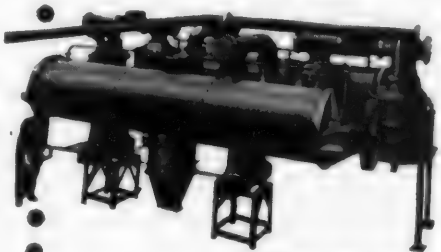

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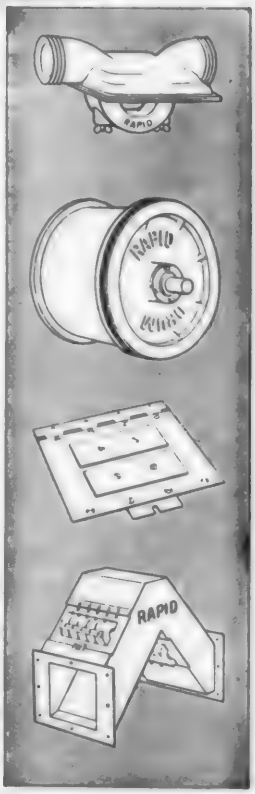

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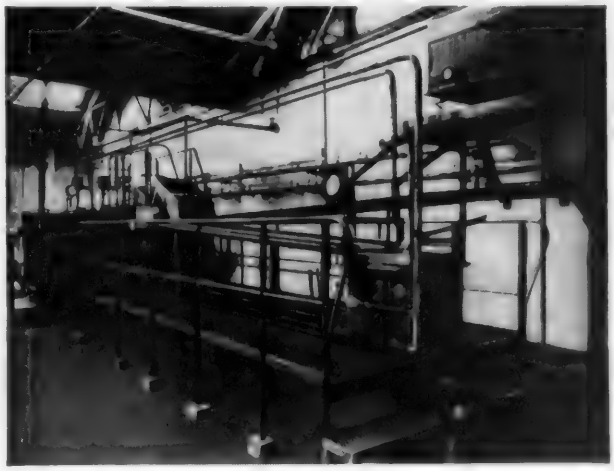

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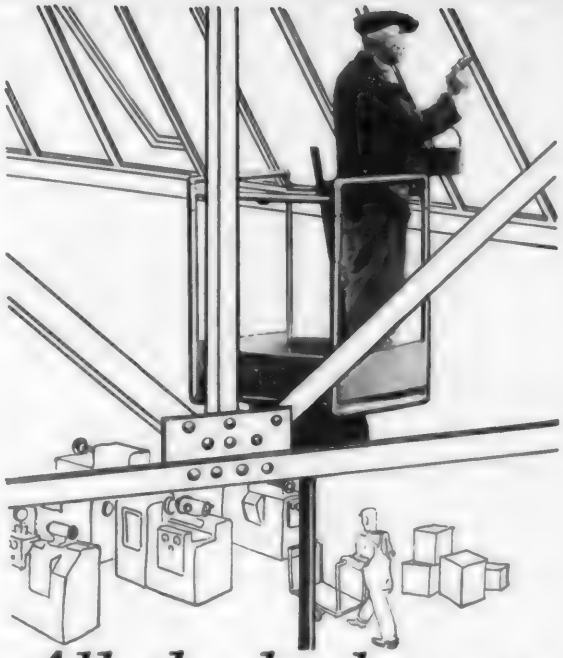

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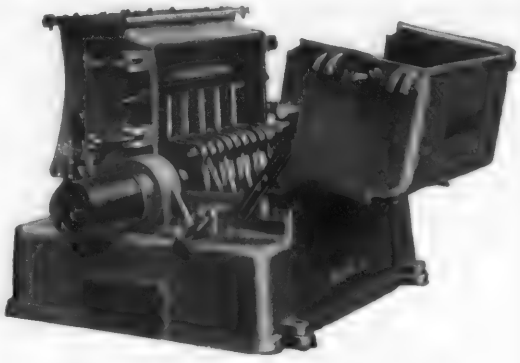

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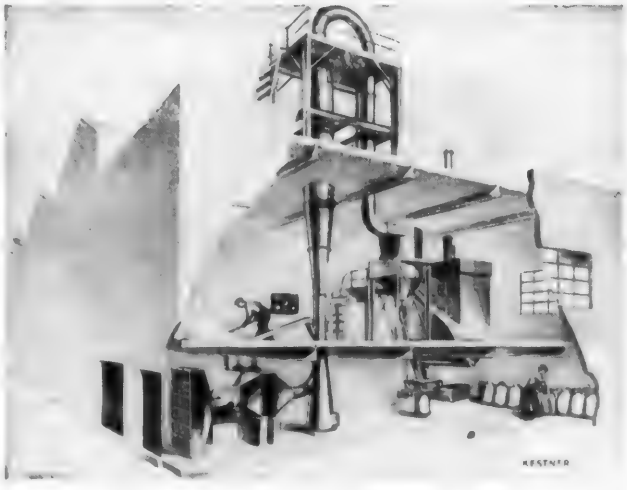

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Outstandingly successful results are being obtained in drying filter cakes, centrifuged materials and deposited sediments such as:

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There are many outstanding advantages which cannot be found in any other type of drying plant.

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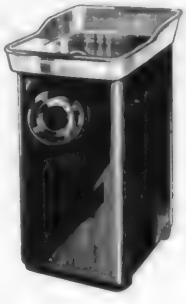

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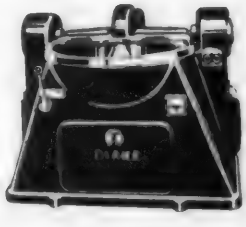

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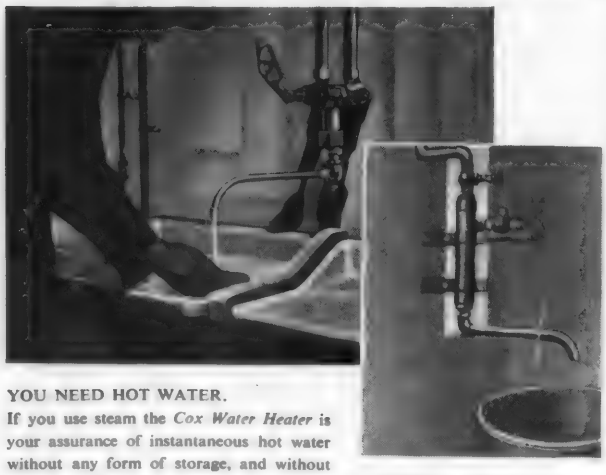

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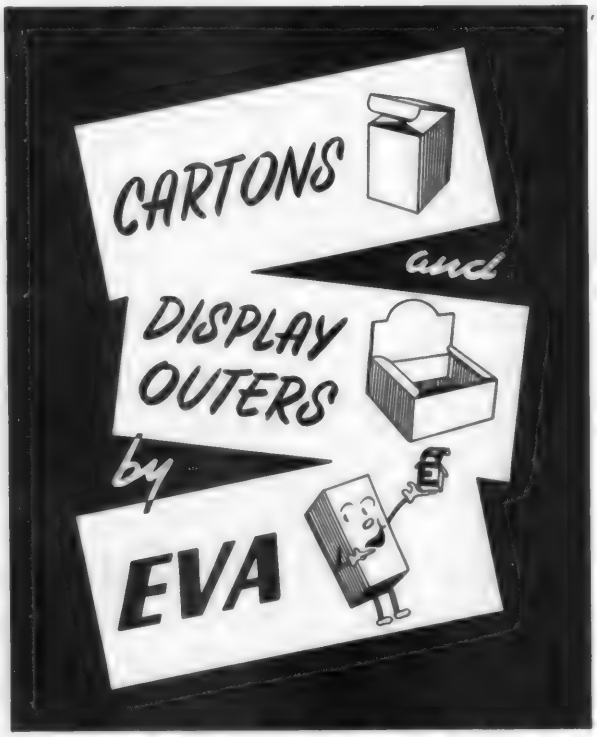

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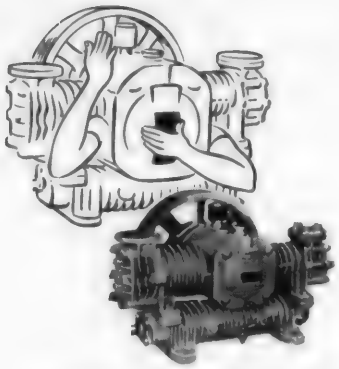

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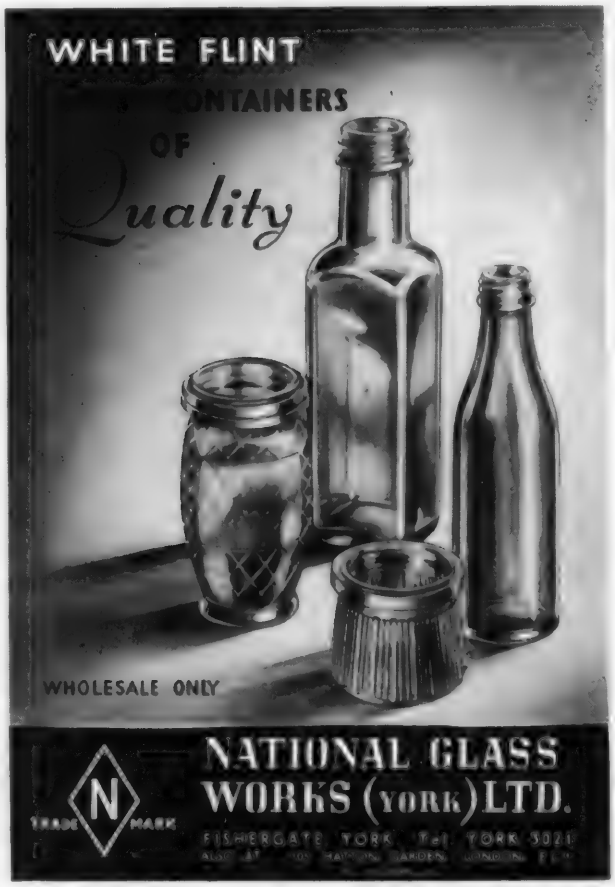

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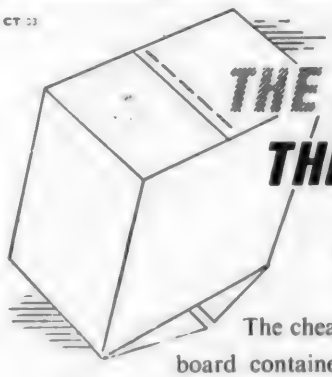

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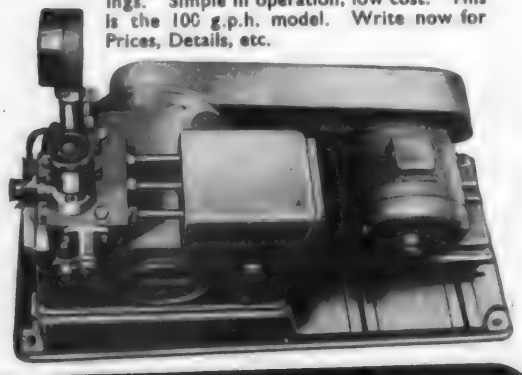

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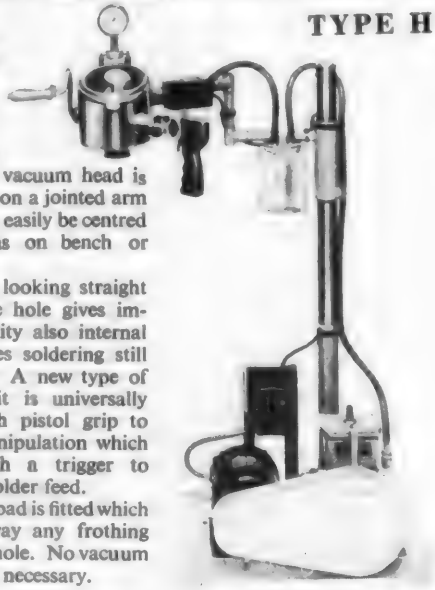

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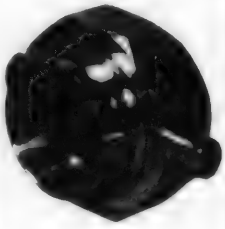

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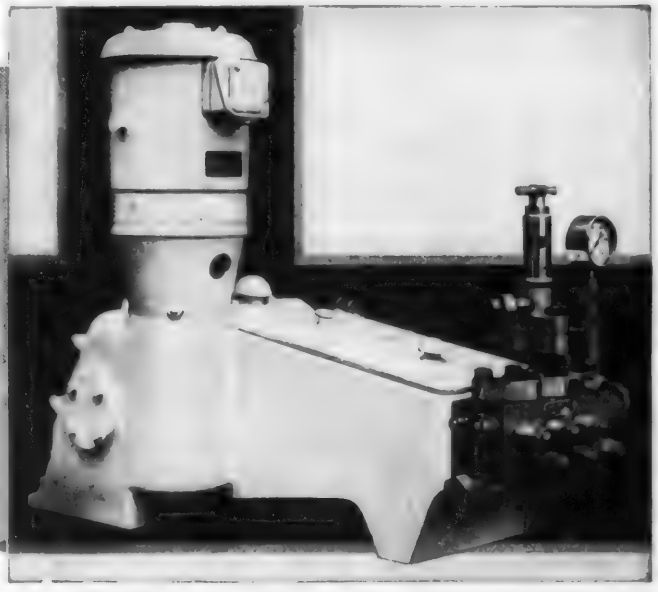

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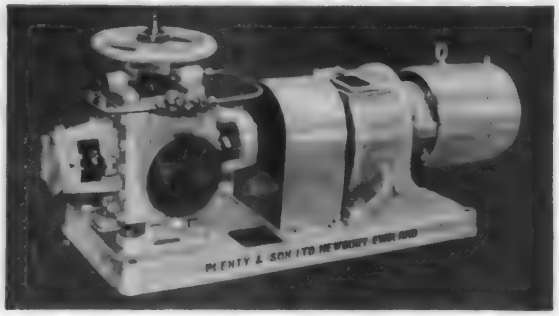

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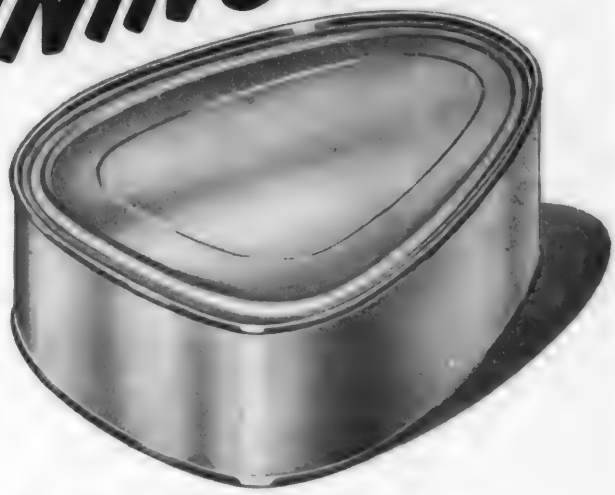

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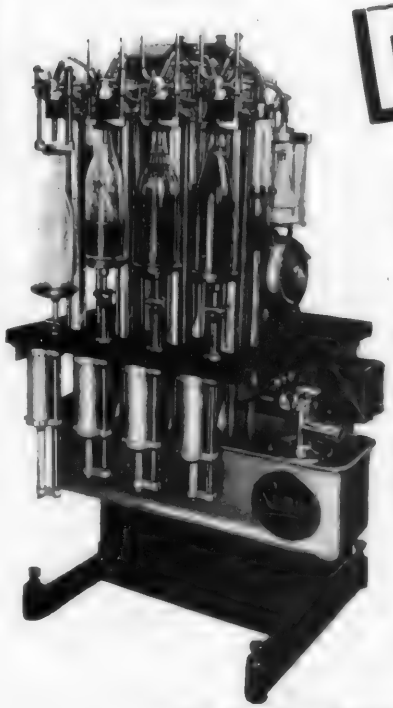

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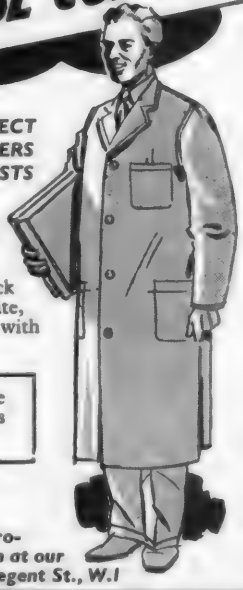

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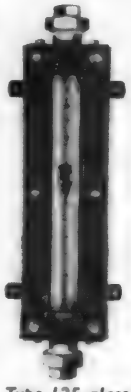

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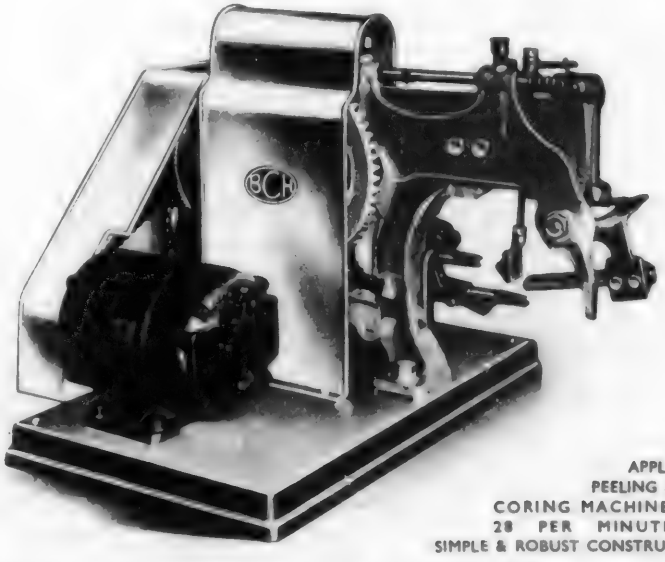

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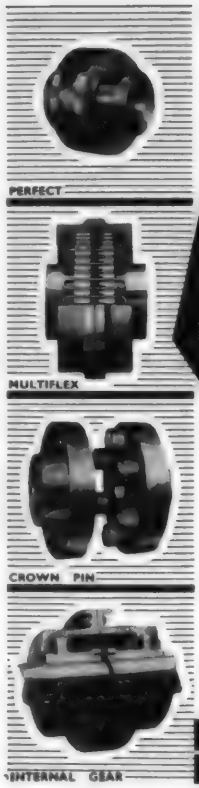

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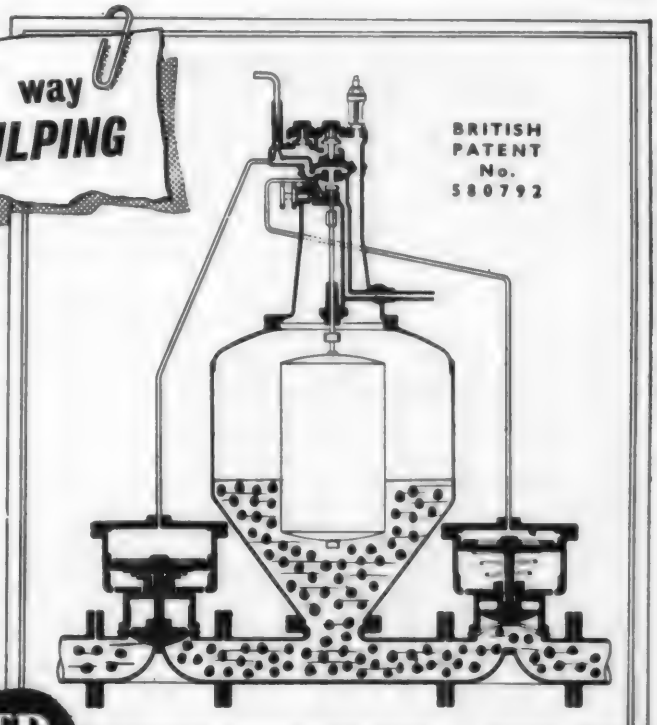

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WANTED: All types of plant for Crisp Manufacturing, including crispers, hydros, sealers, pans, etc.—L.E.B. (Food Products), Albert Road, Skegness. Tel.: 1442.

WANTED: three jacketed gas Boilers of 50 to 60 gall. capacity.—E. R. Hughes and Sons Ltd., Brecon Street, Liverpool, 6.

CHOCOLATE Mixing and Tempering Kettles required, capacity 500-1,000 lb.—Please send particulars, including condition and price required, to Box B4148.

SPARE Cutting Head for B.C.H.-No. 2 Table Jelly Cutting Machine. Suitable for cutting sub-divided jellies from sheet size 20 in. by 19½ in. Condition immaterial. Can anyone help?—Details to Box B4147.

WANTED: Up to 15 (fifteen) second-hand Fraser-type Horizontal Retorts, 6 by 3 by 3. Minimum working pressure 15 (fifteen) lb.—Gaylord House Ltd., Gaylord House, Rennie Street, Salford, 5, Lancashire.

DRIED ALBUMEN MACHINERY REQUIRED

Advertiser interested in acquiring machinery to dehydrate hen egg albumen, either Spray or Cabinet.

Apply Box B4143.

WANTED

VINEGAR PLANT

capable of producing 5,000 to 6,000 gallons of malt vinegar per week. Must be in first class condition.—Box B4029.

MISCELLANEOUS WANTS

MEDICAL bottles; tablet bottles; jars; bottle closures, bakelite and metal purchased. Best prices paid.—Samples and full details in first instance to Noel Davold and Co., 9, Laurence Pountney Lane, Cannon Street, London, E.C.4. Tel.: MANsion House 3951-2.

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AUSTRALIAN Sweetened Dessert Powder 60% sugar, 40% maize or wheat starch. Traces of colouring and flavouring as required. Available for prompt shipment at very favourable prices.—Buyers write to Box B4142.

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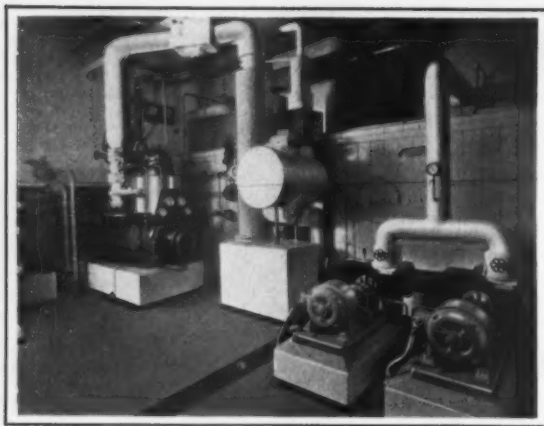

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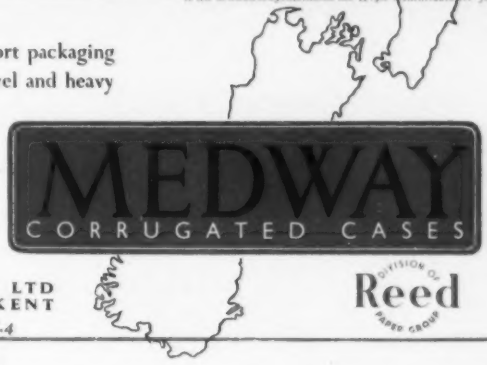

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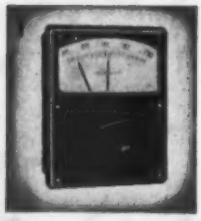

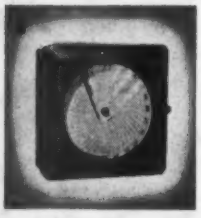

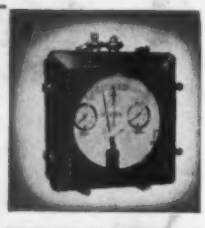

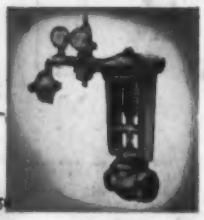

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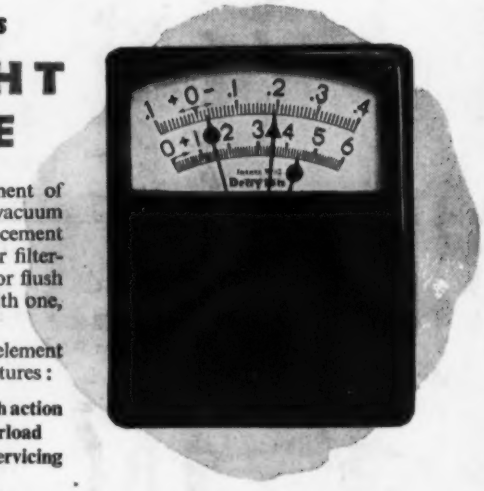

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